
MONROE TOWNSHIP SCHOOLS

INFLUENZA PANDEMIC MANAGEMENT

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Gail Reynolds, LCSW, Ed.D, Project Director
Readiness & Emergency Management for Schools
Middlesex County Vocational & Technical Schools

Consultant:
Drew A. Harris, DPM, MPH
NJ Center for Public Health Preparedness
University of Medicine & Dentistry of New Jersey

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Preface

Pandemic is defined as a disease affecting or attacking the population of an extensive region, including several countries, and/or continent(s). Pandemic flu occurs when a new influenza virus emerges for which people have little or no immunity, and for which there is no vaccine. The disease spreads easily person-to-person, cause's serious illness, and can sweep across the country and around the world in very short time. There is no flu pandemic at this time.

The development of vaccines, antiviral drugs and other medical advances has provided new tools in the fight against emerging diseases, but only provides limited impact. Existing influenza vaccine only protects against previously circulating strains of the disease. About six to nine months are required to develop a vaccine in response to a newly identified strain, a period during which the entire population is vulnerable. Experience with Severe Acute Respiratory Syndrome (SARS), for which no effective treatment has been discovered, has reminded us of the speed at which disease can be spread throughout the world.

The response to, and mitigation of, the health and social consequences of influenza pandemic will take place at both the state and local levels, with the New Jersey Department of Health and Senior Services assuming the lead for the public health response. Based on studies of past pandemics, the most effective approach seemed to be when actions were taken early and quickly. Cities and jurisdictions that responded faster and with more layered protective measures fared better. In order to rapidly respond to crisis situations, all Middlesex County Schools should have a frequently updated Emergency Management Plan. Such plans should be flexible to encompass all hazards, including pandemic flu. They should address the four phases of emergency management planning: Mitigation and Prevention, Preparedness, Response and Recovery.

The following Middlesex County Schools Pandemic Influenza Management Plan is an addendum to the districts' Emergency Management Plan. It is designed as a template with specific steps to address the unique challenges that could rapidly unfold. It can be customized by adding information that is unique to the individual school/district. The template links the four phases of emergency planning to the topics that need to be covered by all schools. These include: 1) Planning, coordination and evaluation, 2) Continuity of student learning and core operations, 3) Infection control policies and procedures, and 4) Communications planning. It also identifies legal authorities and organizational structures that facilitate pandemic response activities.

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Background

According to the World Health Organization (WHO), the medical arm of the United Nations:

"An influenza pandemic occurs when a new influenza virus appears against which the human population has no immunity, resulting in several simultaneous epidemics worldwide with enormous numbers of deaths and illness. With the increase in global transport and communications, as well as urbanization and overcrowded conditions, epidemics due to the new influenza virus are likely to quickly take hold around the world."

Influenza epidemics happen nearly every year (often called "seasonal influenza"), causing an average of 36,000 deaths and 200,000 hospitalizations in the United States, annually. As a result of exposure to similar viral strains and the use of flu vaccines, many people have full or partial immunity to circulating seasonal influenza strain and the epidemic is limited.

Influenza viruses experience frequent minor changes to their genetic structure. A new vaccine is needed each year to cover predicted changes in the circulating strain and offer people more complete protection. Occasionally, however, the virus undergoes a major change in genetic composition. It is this major genetic shift that creates a "novel" virus and the potential for a pandemic, which is a global epidemic. Influenza pandemics have occurred for centuries, three times (1918, 1957 and 1968) in the 20th century alone. It is estimated that there were more than 500,000 deaths in the United States and approximately 20 million deaths around the world during the 1918 pandemic.

With the improvement in medical care and technology, there were fewer fatalities in the subsequent pandemics of 1957-58 and 1968-69, 70,000 and 34,000 deaths, respectively. Another pandemic is highly likely, if not inevitable. According to the March 20, 2006 issue of the Time Magazine, the US Government has set aside \$675 billion for dealing with a possible influenza pandemic. The Centers for Disease Control (CDC) estimates that there will be between 89,000 and 207, 000 deaths in the United States during the next pandemic.

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These are the CDC estimates for the impact of a major influenza pandemic on New Jersey.

Table 1

Percentage of Population Affected by the Next Pandemic	Number of Affected In New Jersey (Pop.: 8,052,849)	Number of Affected In Middlesex County (Pop.: 789,515)
Up to 35% will become ill	2,818,497	276,330
Up to 19% outpatient services	1,530,041	150,008
Up to 0.4% hospitalized	32,211	3,158
Up to 0.1% result in death	8,053	790

Source: CDC estimates:

When the novel H1N1 flu outbreak was first detected in mid-April 2009, CDC began working with states to collect, compile and analyze information regarding the novel H1N1 outbreak. On July 24, 2009 official reporting of individual cases of confirmed and probable novel H1N1 infection was discontinued. Below is a summary of information gathered during the first weeks of the outbreak. These key disease characteristics are thought to remain an accurate representation of novel H1N1 flu.

Pandemic Influenza is a global outbreak of disease that occurs when three conditions are met:

- A new influenza type emerges
- It causes serious human illness
- It spreads easily from person to person

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The following district administrators and staff members developed this plan:

<u>Name</u>	<u>Position</u>	<u>Contact Information</u>
Dr. Kenneth R. Hamilton	Superintendent of Schools	732-521-2111
Jeff Gorman	Assistant Superintendent	732-521-3331
Wayne Holliday	Business Administrator/Bd. Secy.	732-521-1500
Joseph King	Director Pupil Personnel	732-521-3200
Robert O'Donnell	Supervisor of Mathematics	732-521-3168
Lisa Aaron	Supervisor of Languages/Media	732-521-3714
Robert Goodall	High School Principal	732-521-2882
Reggie Washington	Director of Technology	732-521-2882 ext. 1034
Dennis Ventrello	Elementary Principal	609-655-7642
Peggy Eckstein	Elementary Nurse	732-251-1177
MaryAnn Procopio	High School Nurse	732-521-2882 ext. *3

The following school and district administrators reviewed and approved this plan:

<u>Name</u>	<u>Position</u>	<u>Contact Info</u>
Chari Chanley	Middle School Principal	609-655-0604
Carol Schwalje	Elementary Principal	732-521-1000
Dori Alvich	Elementary Principal	732-521-1101
Lynn Barberi	Elementary Principal	732-251-5336
Victor Soriano	Middle School Principal	732-251-1177

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I. Planning, Coordination & Evaluation

A. Principles

- The School Influenza Pandemic Management Plan is an addendum to the school and district all-hazards emergency plan.
- *Influenza pandemic* is a low-to-moderate probability event with significant consequences. Effective and comprehensive planning will help to mitigate the impact of influenza pandemic on a school system.
- Preparing for *influenza pandemic* will help prepare schools for other hazards and threats such as natural disasters, intentional acts and technologic emergencies. These preparations should be part of an all-hazards assessment and preparedness process.
- Coordinated pandemic influenza planning must occur across the entire school system and in conjunction with community partners, including:
 - Local & county public health agencies
 - Local emergency management agencies
 - Community hospitals
 - Community healthcare providers
 - Local & county governmental officials
 - Local faith-based institutions
 - Union representatives
 - Health insurance companies
 - Local charities and other civic organizations.
- All planning should be consistent with the national planning framework that includes the National Incident Management System (NIMS) and the National Response Plan (NRP)
- This plan is based on the following:
 - World Health Organization's (WHO) Pandemic Alert Phases, which describes the progression from no circulating influenza virus of human significance to a worldwide pandemic.
 - The NJ Department of Health and Senior Services (NJDHSS) influenza plan.
 - The US Centers for Disease Control and Prevention (CDC) Pandemic Severity Index; an assessment of the potential human impact of a currently circulating influenza virus strain.

Follow the above web links or refer to Appendix A.

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B. Pandemic Planning Assumptions

(Adapted from Federal Pandemic Flu Plan: pandemicflu.gov/plan/pandplan.html)

1. Health Impact Assumptions

- Susceptibility to the pandemic influenza virus will be universal. The seasonal flu vaccine given every year will not provide protection against a pandemic influenza virus.
- There will be at least a three (3) week warning period before the pandemic reaches the Continental United States.
- Efficient and sustained person-to-person transmission signals an imminent pandemic. This is the WHO's Pandemic Phase 5.
- The clinical disease "attack rate" (number of people who become ill) will likely be 30% or higher in the overall population during the pandemic. Illness rates will be highest among school-aged children (about 40%) and decline with age. Among working adults, an average of 20% will become ill during a community outbreak.
 - Some persons will become infected but not develop clinically significant symptoms.
 - Asymptomatic or minimally symptomatic individuals can transmit infection, but will develop immunity to subsequent infection.
- Of those who become ill with influenza, 50% will seek outpatient medical care.
 - With the availability of effective antiviral drugs for treatment, this proportion may be higher in the next pandemic.
- The number of hospitalizations and deaths will depend on the virulence of the pandemic virus. Estimates differ about 10-fold between more and less severe scenarios, but could be as high as 2%.
 - Risk groups for severe and fatal infection cannot be predicted with certainty but are likely to include infants, the elderly, pregnant women, and persons with chronic medical conditions.
 - The CDC Pandemic Severity Index will be the federal government's best estimate on the human impact of the circulating pandemic strain.
- Rates of absenteeism will depend on the severity of the pandemic.

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- In a severe pandemic, absenteeism attributable to illness, the need to care for ill family members and fear of infection may reach 40% during the peak weeks of a community outbreak.
- Public health measures (closing schools, quarantining household contacts of infected individuals, "snow days") designed to limit or control the spread of the pandemic are likely to increase rates of absenteeism.
- The typical incubation period (interval between infection and onset of symptoms) for influenza is approximately 2 days.

Persons who become ill may shed virus and can transmit infection for up to one day before the onset of illness. Viral shedding and the risk of transmission will be greatest during the first 2 days of illness. Children usually shed the greatest amount of virus and therefore are likely to pose the greatest risk for transmission.

On average, infected persons will transmit infection to approximately two other people.

In an affected community, a pandemic outbreak will last about 6 to 8 weeks.

Multiple waves (periods during which community outbreaks occur across the country) of illness could occur with each wave lasting 2-3 months. Historically, the largest waves have occurred in the fall and winter, but the seasonality of a pandemic cannot be predicted with certainty.

Antiviral will be in limited supply throughout the pandemic.

2. Community Impact (Appendix B: Coping Tips and Stress Reaction)

Services providing for fundamental human needs, such as food and medicine, would be in short supply.

During each wave of contagion, there may be significant economic disruption, including inventory shortages, shipment delays, and reduced business activities.

There could be significant disruption of public and privately owned critical infrastructure including transportation, commerce, utilities, public safety and communications.

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3. Mitigation Strategy Assumptions

- Social distancing strategies aimed at reducing the spread of infection such as closing schools, community centers, and other public gather points and canceling public events may be implemented during a pandemic.
- Personal protective equipment (PPE) will be in short supply but will be essential for those persons at increased risk of exposure to pandemic influenza.

4. Communication Assumptions (Appendix B: Sample Parent Letters)

- Internal and external communications will need to be intensified and coordinated.
- There will be widespread circulation of conflicting information, misinformation, and rumors.

5. School-Specific Assumptions

- Contagious employees - both asymptomatic and symptomatic - will come to work.
- Models suggest that early closure of the schools will help slow the spread of influenza through a community and lower its overall impact.
- Closure of the schools will be a joint decision involving the school district, state, and local health departments (See Appendix C for local health departments).
- After the first wave passes, resumption of normal activities in private and public sectors may be difficult. There will be grieving for deceased and concerns over the next pandemic wave (in the event that an effective vaccine is not available during or after the first wave).
- Neighborhood schools, its teachers, staff and nurses, are frequently an important and trusted source of information for families of school-aged children, especially in immigrant, minority and lower socioeconomic communities. It is expected that this important function will continue during an influenza pandemic

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6. Plan Organization

Traditional emergency response plans are organized into four phases: "prevention-mitigation," "preparedness," and "recovery." These phases roughly correlate to the CDC/WHO Pandemic Phases (Appendix A). This plan builds upon these structures, but also incorporates additional detail to generate **School Response Levels** that are linked to these emergency response phases and pandemic and includes *action items* specific for influenza pandemic for each of the phases.

Table 2

Traditional Emergency Response Phase	Pandemic Phase (NJDHSS, CDC, WHO)	School Response Levels (Source: Broward County Public Schools)
<u>Prevention- mitigation</u>	<u>Interpandemic phase</u> (CDC/WHO phases 1-2); <i>No new influenza virus sub-types detected in humans.</i>	<u>Level One (L1)</u> Committee met on January 23, 2008 at 9:30 a.m. to plan for potential outbreak
	<u>Pandemic alert period</u> (CDC/WHO Phases 3-4) <i>No/little human-to-human transmission, but circulating influenza virus could mutate to a pandemic strain.</i>	
<u>Preparedness</u>	<u>Heightened Pandemic Alert Period</u> (WHO/CDC Phase 5) <i>Large clusters of human- to-human trans-mission, especially in US, but none in NJ.</i>	<u>Level Two (L2)</u> Distribute letters to parents, post on district website, communicate with parents via Global Connect
<u>Response</u>	<u>Pandemic Period</u> (WHO/CDC Phase 6) <i>Increased and sustained transmission in the New Jersey population.</i>	<u>Level Three (L3)</u> District will closely monitor student and parent illnesses and maintain constant communication with the County Health Department
		<u>Level Four (L4)</u> District will notify parents and list procedures to follow regarding potential school closure.
		<u>Level Five (L5)</u> School closure plan and

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Traditional Emergency Response Phase	Pandemic Phase (NJDHSS, CDC, WHO)	School Response Levels (Source: Broward County Public Schools)
		continuity of students learning and Core Operations Plan.
<u>Recovery</u>	<u>End of Wave</u> <i>Return to Pandemic Alert Period</i>	<u>Level Six (L6)</u> Follow all example trauma teams and utilize outside services
	<u>Successive Wave(s)</u> <i>Return to Heightened Pandemic Alert and Pandemic Periods.</i>	

C. Organization and Responsibilities

The *school district* should perform the following functions as needed:

- Establish provisions for notification, comments, etc.;
- Develop and maintain this plan in collaboration with other agencies;
- Identify resources (personnel, supplies, reference materials) to carry out an emergency vaccination or medication dispensing/administration clinic;
- Obtain information from neighboring jurisdictions, as needed to develop and maintain this plan;
- Coordinate emergency exercises as needed; and
- Conduct, or otherwise arrange to provide, emergency-related training as needed.
- Administrators and/or designees will develop and maintain procedures for implementing this plan.

D. Plan Development, Review, Evaluation and Maintenance

This plan should be reviewed and updated as necessary, such as after an exercise or an actual outbreak, but not less than annually.

Those items that should be reviewed include, but are not limited to:

- Community notification and alerting lists, including 24/7 contact information for appropriate personnel.
- Inventories and/or identified sources of critical equipment, supplies, and other resources.
- Facility and community-specific functions and procedures.
- The identification of key personnel is critical for the review and maintenance of this plan.

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- Dr. Kenneth R. Hamilton, Superintendent of Schools is responsible for distribution, coordination, review and maintenance of this plan.
- Dr. Kenneth R. Hamilton, Superintendent of Schools must ensure the involvement of all affected parties in the development, implementation and review of the plan.
- Dr. Kenneth R. Hamilton, Superintendent of Schools maintain a list of plan holders and ensure that all have a copy of the latest plans.

Table 3 outlines specific action steps for each level of response identified in Table 2.

Table 3

Planning, Coordination & Evaluation (PCE)	
Specific Action Items by School Pandemic Response Level	
Level 1 - Plan for it	<ul style="list-style-type: none"> <input type="checkbox"/> L1-1. Appoint a pandemic manager to co-ordinate plan development. <input type="checkbox"/> L1-2. Ensure this plan is consistent with district and school emergency response plans. <input type="checkbox"/> L1-3. Ensure this plan is consistent with the health department plan. <input type="checkbox"/> L1-4. Assist the school district in any exercises, where appropriate. <input type="checkbox"/> L1-5. Ensure that the school district is represented at community preparedness exercises, where appropriate. <input type="checkbox"/> L1-6. Establish an Incident Command System (ICS) for a pandemic outbreak identifying appropriate personnel and chain of command in case of illness (three layers deep). <input type="checkbox"/> L1-7. Create a contact list of key personnel with a consistent update schedule. <input type="checkbox"/> L1-8. Determine any potential waivers needed to district, county or state policies/requirements. <input type="checkbox"/> L1-9. Archive all planning materials in both paper and electronic formats and distribute to district and school offices and the planning team. <input type="checkbox"/> L1-10. Develop procedures for <i>mass dispensing</i> of anti-viral medications and vaccines in schools in coordination with local public health authorities. Include as appendix to this plan. <input type="checkbox"/> L1-11. Develop <i>school closure procedures</i> and include as appendix to this plan. <input type="checkbox"/> L1-12. Develop and <i>conduct exercises</i> in conjunction local public health and emergency management authorities to test this plan.
Level 2 - Take Advanced precautions	<ul style="list-style-type: none"> <input type="checkbox"/> L2-1. Review pandemic plan in the event of full implementation, checking for up-to-date information from state education and local, county and state public health departments. <input type="checkbox"/> L2-2. Communicate any state public health directives to the district schools. <input type="checkbox"/> L2-3. Assist the schools in the collection of student and staff absentee statistics. <input type="checkbox"/> L2-4. Consult with schools officials prior to issuing public health orders that affect the schools. <input type="checkbox"/> L2-5. Update contact list.

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Planning, Coordination & Evaluation (PCE)

Specific Action Items by School Pandemic Response Level

Level 3 - *Keep alert (Initiate surveillance & heightened awareness.)*

- ☐ L3-1. Maintain links with relevant agencies and community support networks.
- ☐ L3-2. Review pandemic plan.
- ☐ L3-3. Check staff and student contact details.
- ☐ L3-4. Monitor recent domestic and international travel of staff, students and parents.
- ☐ L3-5. Confirm school's role in local response plans with local health department and OEM.
- ☐ L3-6. Review mass dispensing procedures.
- ☐ L3-7. Review school closure procedures.

Level 4 - *Prepare for possible school(s) closure*

- ☐ L4-1. Make preparations for possible school closure.
- ☐ L4-2. Ensure clear line of communication with officials authorized to make this decision (governor, health commissioner, education commissioner, local health officer, etc.)

Level 5 - *Implement full activation of Response Plan – School Closure*

- ☐ L5-1. Close school(s) as directed by health department or other authorized officials, according to school closure procedures.
- ☐ L5-2. Collaborate with local agencies in making school facilities available in local response efforts, as previously identified.

Level 6 - *Recovery*

- ☐ L6-1. Assess capacity of staff to resume normal school operations; determine staffing needs based on returning student population; provide appropriate staff coverage as necessary.
- ☐ L6-2. Evaluate the success of the pandemic plan and make adjustments.
- ☐ L6-3. Prepare for second wave.

E. Authorities and References

The New Jersey Department of Education has established a protocol for closing schools if there is a pandemic or infectious disease outbreak. Additionally, if the New Jersey Pandemic Influenza Task Force (PIRT) or the Department of Health and Senior Services recommend closure, the Commissioner of Education will convene the department's essential staff to assess and make recommendations to the Governor about the needed response. NJDOE in consultation with the Governor's Office, PIRT and NJDHSS will determine if all or some school districts should be directed to close and implement their protocols for closing.

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Please note, however, that before this protocol is implemented by the NJDOE, key information about the spreading virus is collected by the NJDHSS. The State depends on the local health departments for surveillance and detection of any spreading virus.

F. School Surveillance (Appendix C, Reporting Form and Nurses Letter)

Schools play a vital role in the detection, response and recovery from an influenza pandemic. Children are at higher risk of the disease and more likely to spread it through a community. The actions taken by school officials could have a significant impact beyond school teachers, staff and students to include the entire community.

Even if regular classes are suspended during an outbreak, schools can contribute to the community response by providing important information to the public, productive activities for children who are isolated or quarantined. Thus, school influenza pandemic preparedness plans should be developed in coordination with and integrated with community-wide plans. School officials should be actively involved in community preparedness efforts.

School districts should work with local health departments to develop policies and procedures to:

- Identify and isolate infected or potentially exposed students;
- Disseminate information to students, families and staff;
- Mass distribute prophylactic medications or vaccines to students and staff
- Assist with community isolation and quarantine efforts; and
- Assist with community mass prophylaxis and vaccination efforts

The following NJDOE flow chart outlines the process for closing schools. According to this protocol, the Office of the County Superintendent will notify the school district of NJDOE's decision to close one or all schools.

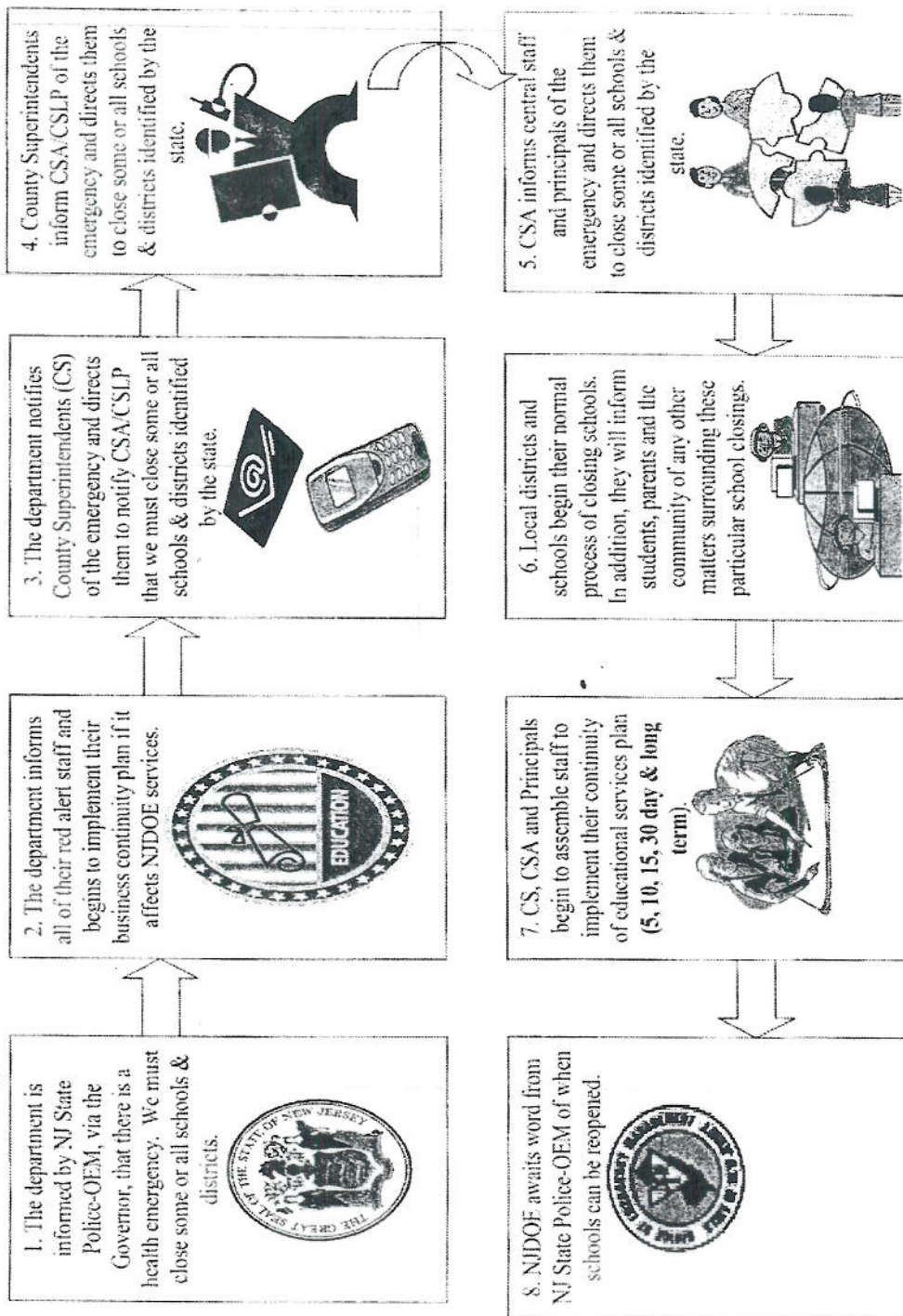
In the event that the State and/or NJDOE has not made a decision on school closures, chief school administrators, charter school lead persons and nonpublic school administrators have the authority to close their respective schools. It is expected, however, that this decision will be made in consultation with the County Superintendent of Schools, the local health department, and the office of emergency management.

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G. Continuity of Operations (COO) - NJDOE Communication Protocol Flow Chart

Continuity of Student Learning and

NJDOE Communication Protocol



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Core Operations Plan in the event of a Pandemic

District Name	Monroe Township	County	Middlesex
Chief School Administrator	Dr. Kenneth Hamilton Superintendent	Chief School Administrator Designee	Mr. Jeff Gorman Assistant Superintendent
# of students	5574	# of Personnel	950
# of schools	7	Off Site Location	
County Superintendent	Dr. Patrick Piegari	Contact Number(s) & Email(s)	732-249-2900 P.piegari@doe.state.nj.us
Law Enforcement	Monroe Twp Chief of Police John Kraivec	Contact Number(s) & Email(s)	732-521-0222 x 122
Office of Emergency Management	Middlesex County Rory Zach	Contact Number(s) & Email(s)	732-727-9009 x 7103
Public Health Office	William Gardner (MT) Lee Dauphinee (MC)	Contact Number(s) & Email(s)	732-521-4400 732-745-8480

II. Continuity of Student Learning and Core Operations

A. Academics

1. Guiding Principles

- Continuity of operations ensures the preservation of student and staff welfare by establishing policies regarding physical and virtual access to the schools.
- Continuity of operations ensures that the schools maintain their educational mission. Planners should consider alternative methods of study, including distance education, and altered standards of educational quality.
- Planners should consider the triggers for canceling athletic or other activities where there is an increased risk of disease transmission.

2. Maintaining Student Learning

Primary Activities for maintaining student learning:

- Student workbooks and textbooks may be distributed for student use.
- Subject specific learning packets have been developed for each of the Core Curriculum Content Areas. The learning packets are designed to support student learning for a period up to three (3) weeks in the event that the schools are closed for an extended period of time.

Secondary Activities for maintaining student learning:

This is a supplemental list of resources that may be used to continue student learning. Careful consideration should be given to the fact that not all students will have access to computers or the internet and those online systems may not be fully functional.

- *E-Boards* - In several districts some of the instructors utilize E-Boards to post assignment and class notices
- *E-Mail* - Many students communicate with their instructors via e-mail
- *On-Line textbooks or CD's* - There are some on-line textbooks in several districts

Monroe Twp. School District
SOCIAL STUDIES & SCIENCE WEBLINKS

SOCIAL STUDIES

K-2 Social Studies:

Lesson Title: Community Helpers webquest:
<http://www.econedlink.org/lessons/index.cfm?lesson=EM454>

Lesson title: Jobs on File:
<http://www.eduplace.com/ss/act/jobs.html>

3-6 Social Studies:

Lesson Title: Natural Resources:
<http://www.eduplace.com/ss/act/natres.html>

6-8 Social Studies

Lesson Title: US Presidents: Kids Quiz
<http://www.whitehouse.gov/history/presidents/index.html>

Lesson Title: Presidential Power: It's use and misuse
<http://www.teachablemoment.org/high/prespowerintro.html>

HS Social Studies

<http://www.homeworkspot.com/high/socialstudies/>
<http://www.youth.net/cec/cecsst/sst-high.html>

SCIENCE

K-2 Science

Lesson Title: Science Mixed Bag
<http://www.physics.isu.edu/~shropshi/k2sites.html>

3-6 Science

Lesson Title: Ed. Science Interactives
<http://www.uen.org/3-6interactives/science.shtml>

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Middle School & HS Science

Chemistry: http://www.science-class.net/Chemistry/changes_reactions.htm

Biology: <http://www.science-class.net/Biology/Biology.htm>

Physics: <http://www.science-class.net/Physics/Physics.htm>

B. Human Resources

1. Guiding Principles

- To create and maintain a mechanism and protocols for the development of personnel policies appropriate to both short-duration and long-duration extraordinary events.
- To promote faculty and staff physical and mental well-being during the event.
- To assure public safety for all personnel housed or working in the schools during an incident.
- To defining and implementing a plan for achieving appropriate depth of cross-training for "core" or "essential" job classifications for the emergency situation

C. Facilities Maintenance

1. Guiding Principles

- To assure that appropriate actions are taken to minimize the risk of viral transmission in school facilities to the greatest extent possible.
- To assure that all facilities can reliably function as part of community response efforts (e.g., a building used as an isolation facility)
- To minimize the time required to restore facilities to their normal use.
- To assure the provision of power, telecommunications, heat and ventilation, water, sewer, janitorial services, etc. appropriate to facilities based on their classification during an event.

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Table 4

<p style="text-align: center;">CONTINUITY OF OPERATIONS (COOP)</p> <p style="text-align: center;">Specific Action Items by School Pandemic Response Level for <i>academic, human resources & facilities</i></p>			
Level of Response	Academic	Human Resources	Facility
<p>Level 1 Plan for it</p>	<p><input type="checkbox"/> L1-1. Develop scenarios describing the potential impact of a pandemic event on student learning, school closings, and extracurricular activities.</p> <p><input type="checkbox"/> L1-2. Develop learning packets for distribution to students in the event of a shutdown. *</p> <p><input type="checkbox"/> L1-3. Plan for continuation of learning using e-learning modalities.</p> <p><input type="checkbox"/> L1-4. Plan for special needs students</p> <p><input type="checkbox"/> L1-5. Plan for students who rely on school food programs</p> <p> *See academic addendum</p>	<p><input type="checkbox"/> L1-6. Identify policies and procedures that need to be in place or need to be revised (e.g. sick leave, personal days)</p> <p><input type="checkbox"/> L1-7. Develop a COOP for payroll and other essential functions.</p> <p><input type="checkbox"/> L1-8. Plan for reduced staff availability (staggered school times, changes in bussing, telecommuting).</p> <p><input type="checkbox"/> L1-9. Cross-train staff on essential functions.</p> <p><input type="checkbox"/> L1-10. Establish an order for certified staff to provide coverage.</p> <p><input type="checkbox"/> L1-11. Plan for sharing of resources and staff amongst schools and districts.</p>	<p><input type="checkbox"/> L1-12. Identify and purchase designated supply kits for immediate and long-term use (e.g. hand sanitizers, masks, first-aid kits).</p> <p><input type="checkbox"/> L1-13. Review cleaning policies, practices and supplies for revisions and needed staff development.</p> <p><input type="checkbox"/> L1-14. Ensure all restrooms, classrooms; locker-rooms have soap, towels, etc.</p> <p><input type="checkbox"/> L1-15. Create templates for notices of closure or other information for building entrances.</p>

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<u>Level 2</u> Take Advanced precautions	<input type="checkbox"/> L2-1.	<input type="checkbox"/> L2-2.	<input type="checkbox"/> L2-3. Identify an isolation room and stock with supplies. <input type="checkbox"/> L2-4. Institute increased disinfectant processes by custodial staff.
<u>Level 3</u> Keep alert (Initiate surveillance & heightened awareness.)	<input type="checkbox"/> L3-1.	<input type="checkbox"/> L3-2.	<input type="checkbox"/> L3-3.
<u>Level 4</u> Prepare for possible school(s) closure	<input type="checkbox"/> L4-1. Prepare student contact lists (two emergency contacts for each). <input type="checkbox"/> L4-2. Global Connect	<input type="checkbox"/> L4-3. Prepare staff contact lists (including willingness to volunteer). <input type="checkbox"/> L4-4. Cancel all staff travel plans.	<input type="checkbox"/> L4-5. Make preparations for securing premises. <input type="checkbox"/> L4-6. Prepare for use by other agencies (health department, OEM, etc.) per previous agreements. <input type="checkbox"/> L4-7. Institute rigorous cleaning policies and practices.

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<p><u>Level 5</u> Implement full activation of Response Plan – School Closure</p>	<p><input type="checkbox"/> L5-1. Provide previously developed materials to home-bound students.</p> <p><input type="checkbox"/> L5-2.</p>	<p><input type="checkbox"/> L5-3.</p>	<p><input type="checkbox"/> L5-4. Secure premises.</p> <p><input type="checkbox"/> L5-5. Post provided notices of closure on entry points and main buildings.</p> <p><input type="checkbox"/> L5-6. Collaborate with local agencies in making school facilities available in local response efforts, as previously identified.</p>
<p><u>Level 6</u> Recovery</p>	<p><input type="checkbox"/> L6-1.</p>	<p><input type="checkbox"/> L6-2. Mobilize the Crisis Recovery Team to address mental health needs, including additional recovery material for the provision of psychological-emotional support for students, staff, families and a safe place for counseling.</p>	<p><input type="checkbox"/> L6-3. Cleaning, disinfecting of affected areas including school buses and remote locations.</p>

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III. Infection Control Policies and Procedures (ICPP)

Guiding Principles for organizations working in coordination with local public health officials: *"Recognize," "Respond," and "Report"*

A. Recognize Early

- Immediately report suspected influenza cases to public health authorities.
- Communicate, collaborate, and coordinate surveillance, epidemiology, and containment activities with public health authorities.

B. Surveillance and Epidemiology (Appendix C)

Schools will track the number absentees and specifically monitor for student and staff reporting signs and symptoms of influenza. The timing, specifics and scope of surveillance activities will be conducted under the supervision and close coordination of the local health department.

C. Transmission Containment

Measures should be undertaken to limit the spread of germs amongst students and staff. These include "social distancing" or "non-pharmaceutical interventions" and include the following:

- Increasing separation amongst students
- Hand, cough and sneeze hygiene
- Disinfection of contaminated surfaces

D. Case Isolation

Procedures should be developed for handling students and staff who have the signs and symptoms of influenza. These include:

- Providing masks for the affected to wear.
- Identifying a place to isolate the affected.
- Developing policies for discharging sick students.
- Develop procedures for transporting sick students.

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E. Quarantine

People who have been exposed to influenza are at risk for contracting and becoming sick themselves. Since people can be contagious up to 24 hours before showing signs and symptoms, it may be necessary to quarantine (separate them from other people) these individuals until they show symptoms or are proven to be germ free.

Typically, it is health department officials who draft and enforce orders of quarantine. Because an influenza outbreak is expected to be fairly widespread, official quarantine is unlikely. However, informal self-quarantine to prevent the spread of infection to contacts is likely to be encouraged.

F. Work Quarantine

Some people, by virtue of their home or work situation, are unable to stay home for an extended quarantine. They may provide essential services. It is also possible that so many people will be exposed that home quarantine will be entirely impractical. These individuals can continue to work provided certain precautions are taken.

- Social distancing (see below)
- Respiratory protection (mask)
- Gloves
- Strict hand washing enforced
- Facility disinfection procedures

G. Mitigation Measures, Including Social Distancing

Implement prevention strategies to make the school environment conducive to good hygiene by:

- Reminding students and staff to clean their hands and make sure they have the supplies to do so by making soap, alcohol-based hand rubs, paper towels, and sinks accessible.
- Reminding students and staff to cover noses and mouths with a tissue or sleeve when coughing or sneezing and have tissues readily available. Make sure tissues are available in all classrooms and common areas such as libraries and lunchrooms and remind students and staff to dispose used tissues in waste receptacles.
- Conducting frequent sanitary, health & safety inspections of the schools. Encourage staff and the custodial team to wipe down any

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surfaces that may have been contaminated by saliva or other respiratory secretions.

Reduce the spread of the virus by identifying the Schools' responsibilities to the students and community:

- Upon notification that a pandemic is occurring, set up prominent notices at all entry points to facilities, advising staff, students, and visitors not to enter if they have symptoms of influenza.
- Educate employees, students, and visitors on how to stop the spread of the virus. Notices containing information regarding hand hygiene, covering coughs and sneezes, and student spacing should be placed around the schools. Fact sheets with this information should be distributed also.
- Established policies and procedures for implementing containment measures (canceling sports events and other mass gatherings?).
- Ensure adequate supplies of tissues, hand sanitizing gels, soap and water and cleaning supplies are available to students and staff.
- In collaboration with the Health Department, develop and implement support plans for "Student Health Centers" that will be designated to triage/evaluate and/or treat influenza patients not requiring hospital care.

1. Student Spacing

Student spacing (social distancing) are non-medical measures intended to reduce the spread of disease from person-to-person by discouraging or preventing people from coming in close contact with each other. Education on student spacing should be distributed to all staff, students and parents.

Student spacing strategies may include:

- Spacing students' desks three (3) feet apart, in small pods or clusters.
- Discouraging prolonged congregation in hallways, lunch rooms etc.
- Limiting group activities and interaction between classes
- Canceling gym classes, choir or other school activities that place individuals in close proximity.

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2. School Cleaning

Disinfecting shared work areas, counters, railings, door knobs and stair wells should be performed more frequently during the influenza pandemic.

Managing Illness in Staff, Students or Visitors

- In collaborations with the local Health department, educate staff and students regarding symptoms of illness.
- If a person becomes ill, or if someone observes that another person is exhibiting symptoms of influenza at work/school, make sure the ill person leaves the school as soon as possible.
- Encourage sick students and staff to stay home until they have been without fever for 24 hours to help prevent spreading illness to others.
- Invoke your school policy about staying home and returning to work/school.

Table 5

INFECTION CONTROL POLICIES AND PROCEDURES (ICPP)	
Specific Action Items by School Pandemic Response Level	
Level 1 - Plan for it	
<input type="checkbox"/> L1-1. Review district emergency response and infectious disease policies and procedures for necessary revisions.	
<input type="checkbox"/> L1-2. Develop plan for moving students from one area of a school to another (isolation of sick students until pick up) and for moving well students from one to school to another if necessary.	
Level 2 - Take Advanced precautions	
<input type="checkbox"/> L2-1. Follow identified precautionary measures.	
<input type="checkbox"/> L2-2. Identify an isolation room and stock with supplies.	
Level 3 - Keep alert (Initiate surveillance & heightened awareness.)	
<input type="checkbox"/> L3-1. Implement prevention strategies to make the school environment conducive to good hygiene.	
Level 4 - Prepare for possible school(s) closure	
<input type="checkbox"/> L4-1. Institute procedures to identify staff and students showing influenza symptoms.	

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INFECTION CONTROL POLICIES AND PROCEDURES (ICPP)

Specific Action Items by School Pandemic Response Level

Level 5 - Implement full activation of Response Plan – *School Closure*

Level 6 - Recovery

- ☐ L6-1. Be prepared for another wave of influenza in a few weeks.
- ☐ L6-2.

IV. Communications Planning

According to the 2007 NJ School Safety Guidelines:

"Coverage of events by representatives of the communications media can make or break the success of an operation. In all emergencies, remember that there are two versions of reality. First is the actual event, what is really happening, and second, what people think is happening based on rumors, media reports, past history and perceptions of what they know and hear."

A. *Guiding principles* (Appendix D, Sample Press Releases and Key Messages for PIO)

- Prior to the event, designate one representative within your planning team to deal with the parents and the media.
- The designated Public Information Officer (PIO) may be the Superintendent, Principal or a Media Specialist who is knowledgeable about all aspects of the emergency and able to explain the various activities attendant to the event.
- Call upon the health official to help develop and deliver the message
- Make it clear to staff they should direct media people to the PIO
- Be prepared. Be honest. Be brief. Stress concern for student safety.
- Be accessible. Stick to facts: have facts available about the school and the number of students enrolled.

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TABLE 6

COMMUNICATIONS PLANNING (CP)	
Specific <u>Action Items</u> by School Pandemic Response Level	
Level 1 - Plan for it	
<input type="checkbox"/> L1-1.	Develop and print materials about hand washing, influenza screening and other social distancing and non-pharmaceutical interventions for school and department use.
<input type="checkbox"/> L1-2.	Develop and tape information on awareness of influenza general precautions and pandemic preparation, with broadcast schedule for schools and cable station.
<input type="checkbox"/> L1-3.	Establish link on district web site to www.pandemicflu.gov from <i>News</i> section.
<input type="checkbox"/> L1-4.	Identify and list key stakeholder groups that will need to be informed during an influenza event (e.g. administration, staff, parents, students, local officials).
<input type="checkbox"/> L1-5.	Establish a communications process to communicate with key stakeholders with specific triggers by response level.
<input type="checkbox"/> L1-6.	Identify information to be translated for written and broadcast use at school and community channels.
<input type="checkbox"/> L1-7.	Collaborate with local health department for public service announcements and updates for local distribution.
<input type="checkbox"/> L1-8.	Establish redundant communication systems/channels that allow for the expedited transmission and receipt of information.
<input type="checkbox"/> L1-9.	Inform relevant groups about the district's pandemic plan and their expected role.
<input type="checkbox"/> L1-10.	Draft press release/editorial from superintendent for each pandemic level.
Level 2 - Take Advanced precautions	
<input type="checkbox"/> L2-1.	Update and distribute superintendent's press release/editorial for this level to key stakeholder groups .
<input type="checkbox"/> L2-2.	Update stakeholder contact list.
<input type="checkbox"/> L2-3.	Redistribute influenza precautions and preparedness materials to key stakeholder groups .
<input type="checkbox"/> L2-4.	Provide ongoing briefings to key staff on roles and responsibilities.
DISTRICT HAS ALL THE ABOVE ACCOMPLISHED	
DISTRICT USES ANTIBACTERIAL SOAP INSIDE LOCKER ROOMS, CAFETERIA AND BATHROOMS	

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COMMUNICATIONS PLANNING (CP)

Specific Action Items by School Pandemic Response Level

Level 3 - Keep alert (Initiate surveillance & heightened awareness.)

- ☐ L3-1. Update and distribute superintendent's press release/editorial for this level to **key stakeholder groups**.
- ☐ L3-2. Provide ongoing briefings to key staff on roles and responsibilities, including isolation of students/staff.
- ☐ L3-3. Keep **key stakeholder groups** informed through briefings, conference calls, emails, newsletters and websites.
- ☐ L3-4. Remind staff, students and parents about the:
 - Difference between symptoms of common cold and influenza;
 - Importance of good hygiene practices;
 - Importance of staying home if sick;
 - Gravity of the pandemic through scenarios/stories of 1918 pandemic, etc.

Level 4 - Prepare for possible school(s) closure

- ☐ L4-1. Update and distribute superintendent's press release/editorial for this level to **key stakeholder groups**.

Level 5 - Implement full activation of Response Plan – School Closure

- ☐ L5-1. Update and distribute superintendent's press release/editorial for this level to **key stakeholder groups**.

Level 6 - Recovery

- ☐ L6-1. Update and distribute superintendent's press release/editorial for this level to **key stakeholder groups**.

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APPENDIX A - National Alert and Informational Documents

A. Glossary of Terms

Avian influenza	Avian influenza, also referred to as bird flu, is a disease of birds (e.g. ducks, chickens). Between 2003 and 2006 the H5N1 avian influenza virus has infected millions of birds. Although it is primarily a disease of birds a small number of people have also been infected after having close contact with birds. Also see influenza, seasonal influenza, and pandemic influenza.
Contact	A contact is a term used to refer to someone who has been in close proximity with an individual who is, or is suspected of being, infected with an infectious disease like influenza.
H5N1	H5N1 is the latest avian influenza virus subtype of concern and there appears to be little human immunity to it. The predominant winter strain of human influenza is H3N2. Most adults have some partial immunity to this strain, which caused a pandemic in 1968 when it evolved from avian influenza.
Hand hygiene	Hand hygiene is a term that applies to the cleaning of one's hands. This is usually done with soap and water, hand sanitizer, or hand wipes. To kill an influenza virus hands must be washed with soap and water for 15 seconds and hand sanitizers or wipes must be used for 10 seconds and have an alcohol content of at least 60%.
Human-to-human transmission	Human-to-human transmission refers to the ability of infectious diseases to be passed continuously from one person to another. Some viruses can be transmitted between animals (animal-to-animal), some can be transmitted from animal-to-human (and vice versa), and some can be transmitted from human-to-human.
Infection control	Infection control is broad term used to describe a number of measures designed to detect, prevent, and contain the spread of infectious disease. Some measures include hand washing, respiratory etiquette, use of personal protective equipment (PPE), prophylaxis, isolation, and quarantine.

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Infectious disease	An infectious disease, or communicable disease, is caused by the entrance of organisms (e.g. viruses, bacteria, fungi) into the body which grow and multiply there to cause illness. Infectious diseases can be transmitted, or passed, by direct contact with an infected individual, their discharges (e.g. breath), or with an item touched by them.
Influenza	Influenza is a viral disease that causes high fever, sore throat, cough, and muscle aches. It usually affects the respiratory system but sometimes affects other organs. It is spread by infectious droplets that are coughed or sneezed into the air. These droplets can land on the mucous membranes of the eyes or mouth or be inhaled into the lungs of another person. Infection can also occur from contact with surfaces contaminated with infectious droplets and respiratory secretions. Also see seasonal, avian, and pandemic influenza.
Isolation	Isolation is when sick people are asked to remain in one place (e.g. home, hospital), away from the public, until they are no longer infectious.
Pandemic influenza	A pandemic influenza, or pandemic flu, occurs when a new subtype of influenza virus: 1) develops and there is little or no immunity (protection due to previous infection or vaccination) in the human population; 2) it is easily passed from human to human; 3) is found in many countries; and, 4) causes serious illness in humans. Also see influenza, seasonal influenza, and avian influenza.
Personal Protective Equipment (PPE)	PPE is specialized clothing or equipment worn to protect someone against a hazard including an infectious disease. It can range from a mask or a pair of gloves to a combination of gear that might cover some or all of the body.
Prophylaxis	Prophylaxis is an infection control measure whereby antimicrobial, including antiviral, medications are taken by a healthy individual (e.g. nurse, contact) to prevent illness before or after being exposed to an individual with an infectious disease (e.g. influenza).
Quarantine	A quarantine is when people who have been in close proximity to an infected person, but appear healthy, are asked to remain in one place, away from the general public, until it can be determined that they have not been infected.

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Respiratory etiquette	Respiratory etiquette, or good coughing and sneezing manners, is one way of minimizing the spread of viruses which are passed from human-to-human in the tiny droplets of moisture that come out of the nose or mouth when coughing, sneezing, or talking. Healthy and sick people should cover their nose and mouth when sneezing, coughing, or blowing their nose and then put the used tissue in the trash to prevent the spread of germs.
Seasonal influenza	Seasonal influenza, commonly referred to as the flu, is an infectious disease. In the United States, flu season usually occurs between December and March. The influenza virus is one that has the ability to change easily; however, there is usually enough similarity in the virus from one year to the next that the general population is partially immune from previous infection or vaccination. Each year experts monitor the influenza virus and create a new vaccine to address changes in the virus. For this reason people are encouraged to get a flu shot each year. Also see influenza, avian influenza, and pandemic influenza.
Social distancing	Social distancing is an infection control strategy that includes methods of reducing the frequency and closeness of contact between people to limit the spread of infectious diseases. Generally, social distancing refers to the avoidance of gatherings with many people.

(Adopted from San Francisco "Pandemic Influenza Continuity of Operations Guide & Template")

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B. World Health Organization's Pandemic Influenza Phases

Interpandemic period

Phase 1. No new influenza virus subtypes have been detected in humans. An influenza virus subtype that has caused human infection may be present in animals. If present in animals, the risk of human infection or disease is considered to be low.

Strengthen influenza pandemic preparedness at the global, regional, national and sub national levels.

Phase 2. No new influenza virus subtypes have been detected in humans. However, a circulating animal influenza virus subtype poses a substantial risk of human disease.

Minimize the risk of transmission to humans; detect and report such transmission rapidly if it occurs.

Pandemic alert period

Phase 3. Human infection(s) with a new subtype, but no human-to-human spread, or at most rare instances of spread to a close contact.

Ensure rapid characterization of the new subtype and early detection, notification and response to additional cases.

Phase 4. Small cluster(s) with limited human-to-human transmission but spread is highly localized, suggesting that the virus is not well adapted to humans'

Contain the new virus within limited foci delay spread to gain time to implement preparedness measures, including vaccine development.

Pandemic period

Phase 5. Larger cluster(s) but human-to-human spread still localized, suggesting that the virus is becoming increasingly better adapted to humans, but may not yet be fully transmissible (substantial pandemic risk).

Maximize efforts to contain or delay spread, to possibly avert a pandemic, and to gain time to implement pandemic response measures.

Phase 6. Pandemic: increased and sustained transmission in general population¹⁵

Minimize the impact of the pandemic.

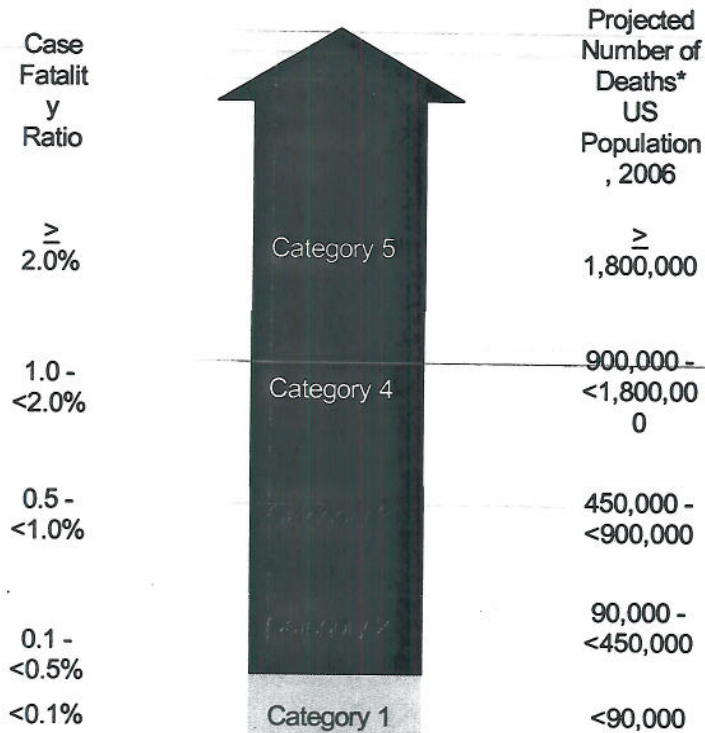
- The distinction between **phase 1** and **phase 2** is based on the risk of human infection or disease resulting from circulating strains in animals. The distinction is based on various factors and their relative importance according to current scientific knowledge. Factors may include pathogenicity in animals and humans, occurrence in domesticated animals and livestock or only in wildlife, whether the virus is enzootic or epizootic, geographically localized or widespread, and/or other scientific parameters.
- The distinction between **phase 3**, **phase 4** and **phase 5** is based on an assessment of the risk of a pandemic. Various factors and their relative importance according to current scientific knowledge may be considered. Factors may include rate of transmission, geographical location and spread, severity

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Source: "WHO global influenza preparedness plan."

<http://www.who.int/entity/csr/resources/publications/influenza/cdf>

C. CDC Pandemic Severity Index



Assumes 30% illness rate
and unmitigated pandemic
without interventions

Source: "CDC Pandemic Severity Index."

<http://www.pandemicflu.gov/plan/panflureport4.pdf>

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MONROE TOWNSHIP SCHOOLS
423 Buckelew Avenue
Monroe Township, New Jersey 08831
www.monroe.k12.nj.us

KENNETH R. HAMILTON, Ed.D.

Superintendent of Schools

JEFF GORMAN

Assistant Superintendent

WAYNE HOLLIDAY

Business Administrator/Board Secretary

Tel: 732-521-2111

Dear Parents/Guardians:

This letter is to provide you with information about how you can help prevent the spread of the flu, what steps we are taking to be proactive and our protocols for responding if we are faced with an outbreak in our district.

First and foremost, prevention is the best medicine. Here are some ways to help protect your children and others from contracting or spreading the flu.

- Keep children home who are sick at least 24 hours after they no longer have a fever or signs of a fever, without the use of fever reducing medicine.
- Teach your children to wash their hands often with soap and water for 20 seconds.
- Teach your children to cover coughs and sneezes with tissue or by coughing into the inside of their elbow.

We will be sending students home who display certain symptoms, which may include, fever 100° or above, sore throat, headache, and muscle ache. Make alternative arrangements for child care in the event that your child needs to be sent home early from school or in the event of a school closure.

We are working on revising our Pandemic Management Plan so that it reflects the most recent available information. Additionally, we are preparing plans that will be available to you in the event that a school closure becomes necessary.

A Task Force is in place to monitor our preparedness for addressing this public health issue. We have also been informed that the H1N1 Vaccination will be available soon. We are considering providing this inoculation on site to ensure equal access. You will be notified when the vaccination is available to us. A consent form will be sent to you which must be returned even if you do not wish to have your child vaccinated.

Lastly, we are suspending perfect attendance incentives this year so that we are not indirectly encouraging students to attend school when they are ill.

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There are some great online resources available to you if you need additional information (www.flu.gov , www.CDC.gov , <http://co.middlesexnj.ces/publichealth>).

Please be sure to check our website for updates as well.

Yours for the sake of all children,

Dr. Kenneth R. Hamilton
Superintendent of Schools

KRH:cv

SAMPLE



MONROE TOWNSHIP SCHOOLS
423 Buckelew Avenue
Monroe Township, New Jersey 08831
www.monroe.k12.nj.us

KENNETH R. HAMILTON, Ed.D.

Superintendent of Schools

JEFF GORMAN

Assistant Superintendent

WAYNE HOLLIDAY

Business Administrator/Board Secretary

Tel: 732-521-2111

Estimados Padres/Parientes:

Esta carta es para informarles como protegerse contra la gripe y darles información de nuestro plan de emergencia para prepararnos si hay un brote de esta enfermedad.

Primero, la prevención es la mejor medida para tomar. Usted puede enseñar a sus hijos y prevenir la propagación de gérmenes que causan enfermedades respiratorias como la gripe de esta manera:

- Cúbrase su nariz y boca con un pañuelo cuando tosa o estornude. Tire el pañuelo a la basura una vez usado. No estornude en las manos sino en el codo o el antebrazo.
- Lávese las manos con agua y jabón por 20 segundos, sobre todo después de toser o estornudar. También puede usar alcohol en gel.
- Evite tocarse los ojos, nariz o boca. Así se diseminan los gérmenes.
- Trate de evitar el contacto con gente enferma.
- Quédese en su casa y no vaya a trabajar o a la escuela si usted está enfermo.
- No puede regresar a la escuela antes de 24 horas sin que no tenga fiebre o no necesita medicina para bajar la fiebre.

Es necesario que regresemos a casa todos estudiantes que tienen síntomas que incluyen fiebre de 100 grados o más, dolor de garganta, dolor de cabeza o dolor muscular. Por favor, prepárense en caso de que los estudiantes tengan que salir temprano durante su día escolar o en una situación en que necesitamos cerrar la escuela.

Estamos desarrollando un Plan de Emergencia que contiene la información más corriente. Además estamos preparando planes que serán disponible para comunicarles cualquier estrategia que sea necesario en caso de una emergencia o si necesitamos cerrar la escuela.

Tenemos un comité que verifica nuestro plan y ellos tienen la responsabilidad de comunicar al público y manejar cualquier situación de salud del público. Hemos sido informados que una vacuna de H1N1 será disponible pronto. Estamos teniendo en cuenta de proveer esta vacuna para asegurar acceso a todos los estudiantes. Ud. recibirá una comunicación cuando esta vacuna sea disponible. Enviaremos a Ud. un formulario que deberá devolver este o no esté de acuerdo con la vacuna para su hijo/hija.

Finalmente, vamos a postergar las prácticas de otorgar premios para cero ausencias porque no queremos animar asistencia a los estudiantes enfermos, ni perjudicarles a los que se queden en casa.

Hay algunos recursos en la red para conseguir más información. (www.flu.gov, www.DCD.gov,
<http://co.middlesexnj.ces/publichealth>). Por favor, mire Ud. nuestro sitio también.

A Ud. por todos estudiantes,

Dr. Kenneth R. Hamilton
Superintendent of Schools

MONROE TOWNSHIP SCHOOLS INFLUENZA
PANDEMIC MANAGEMENT



MONROE TOWNSHIP SCHOOLS
423 Buckelew Avenue
Monroe Township, New Jersey 08831
www.monroe.k12.nj.us

KENNETH R. HAMILTON, Ed.D.

Superintendent of Schools

JEFF GORMAN

Assistant Superintendent

WAYNE HOLLIDAY

Business Administrator/Board Secretary

Tel: 732-521-2111

Dear Parents/Guardians:

This letter will give you information about a flu outbreak in Middlesex County. Every year, some people get sick with the flu during the fall and winter months. This year, there is a new flu virus that is making many people in Middlesex County sick. So many people are sick in New Jersey and the United States that health officials call it a "pandemic flu." A lot of students and teachers in our school are sick with the flu. We hope they will all get better quickly. At this time, the county health department tells us that students who are not ill can safely come to school. The schools will remain open. We will keep you updated with any important information.

To keep the flu from spreading to more people, we ask you to keep sick children home. Any children who are sick in school will be sent home.

Public health officials want you to protect yourself and your family against pandemic flu. Here are some ways to stop the spread of germs and sickness:

- Keep children who are sick at home. Don't send them to school.
- Teach your children to wash hands often with soap and water for 20 seconds. Be sure to set a good example by doing this yourself.
- Teach your children to cover coughs and sneezes with tissues or by coughing into the inside of the elbow. Be sure to set a good example by doing this yourself.
- Teach your children to stay away at least three feet away from people who are sick.
- People who are sick should stay home from work or school and avoid other people until they are fever free for a minimum of 24 hours and illness symptoms are dramatically improved.
- Stay away from shopping malls, movie theaters or other places where there are large groups of people.

We are also giving you some tips about how to care for your family if they are ill. If you have questions, please contact your School Nurse or healthcare provider. You can call the school hotline (732) 521-2882 x 1701. You can get more information by visiting the District website at www.monroe.k12.nj.us. If the pandemic flu continues to spread and more students become ill, schools may close for days or weeks. The purpose of closing schools will be to keep children from getting sick. If schools are closed, children should stay at home. Begin planning now for childcare in your home. Recommendations may change during the course of a pandemic flu outbreak.

Yours for the sake of all children,

Dr. Kenneth R. Hamilton
Superintendent of Schools

KRH:cv

MONROE TOWNSHIP SCHOOLS INFLUENZA
PANDEMIC MANAGEMENT



MONROE TOWNSHIP SCHOOLS
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KENNETH R. HAMILTON, Ed.D.

Superintendent of Schools

JEFF GORMAN

Assistant Superintendent

WAYNE HOLLIDAY

Business Administrator/Board Secretary

Tel: 732-521-2111

Dear Parents/Guardians:

We wrote to you recently to tell you about a pandemic flu outbreak in our community. Here is some new information.

There are now even more students in our school who are ill with this flu virus. Still the county health department tells us that students who are not ill can continue to attend school. The schools will remain open. We will keep you updated with any important information.

(To keep the flu from spreading to more people, we ask you to keep sick children home. Any children who are sick in school will be sent home.)

Public health officials want you to protect yourself and your family against pandemic flu. Here are some ways to stop the spread of germs and sickness and take care of your family

- Keep children who are sick at home. Don't send them to school.
- If some of the people in your home are sick with the flu, keep them away from the people who are not sick.
- If some of the people in your home are sick with the flu and you cannot see a health provider, some things you can do to help them are:
 - Have them drink a lot of liquid (juice, water)
 - Keep the ill person as comfortable as possible. Rest is important.
 - For fever, sore throat and muscle aches, in adults, use ibuprofen (Advil) or acetaminophen (Tylenol). Do not use aspirin with children or teenagers; it can cause Reye's syndrome, a life-threatening illness.
 - Keep tissues and a trash bag within reach of the sick person.
 - Be sure everyone in your home washes their hands frequently.
 - Contact a healthcare provider for further advice. If the ill person is having difficulty breathing or is getting worse, contact the healthcare provider right away.

Call the school hotline (732) 521-2882 x 1701 or visit the the District website at www.monroe.k12.nj.us.

MONROE TOWNSHIP SCHOOLS INFLUENZA
PANDEMIC MANAGEMENT

If the pandemic flu continues to spread and more students become ill, schools may close for days or weeks. The purpose of closing schools will be to keep children from getting sick. If schools are closed, children should stay at home. Begin planning now for childcare in your home.

Yours for the sake of all children,

Dr. Kenneth R. Hamilton
Superintendent of Schools

KRH:cv



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www.monroe.k12.nj.us

KENNETH R. HAMILTON, Ed.D.

Superintendent of Schools

JEFF GORMAN

Assistant Superintendent

WAYNE HOLLIDAY

Business Administrator/Board Secretary

Tel: 732-521-2111

Dear Parents/Guardians:

Middlesex County health officials have ordered all schools in the County to close. This order is because of the pandemic flu situation here. All schools are immediately closed until further notice and children should stay home.

~~Schools may be closed for days or even weeks to reduce contact among children and stop the spread of the flu.~~

We know that many students and their families are very sick. We know this is a hard time for our community and our hearts go out to those who are ill.

Because the flu is easily spread from person-to-person, it is not safe for large groups of people to gather. During this time, both children and adults should stay away from other people and groups as much as possible. They should not gather in locations such as shopping malls, movie theaters or community centers.

We know that it may be hard to get a doctor's appointment, go to a clinic or even be seen in a hospital emergency room. Here are some tips for helping those who are sick with the flu:

- Have them drink a lot of liquid (juice, water).
- Keep the sick person as comfortable as possible. Rest is important.
- For fever, sore throat and muscle aches, use ibuprofen (Advil) or acetaminophen (Tylenol). Do not use aspirin with children or teenagers; it can cause Reye's syndrome, a life-threatening illness.
- Keep tissues and a trash bag within reach of the sick person.
- Be sure everyone in your home washes their hands frequently.
- Keep the people who are sick with the flu away from the people who are not sick.

For more information, call your healthcare provider or visit the Middlesex County Health Care Agency' website <http://co.middlesex.nj.us/publichealth>. Or call the school hotline at (732) 521-2882 ext. 1701 or visit the District website at www.monroe.k12.nj.us.

We will contact you as soon as we have information about when school will reopen.

Yours for the sake of all children,

Dr. Kenneth R. Hamilton
Superintendent of Schools

KRH:cv

MONROE TOWNSHIP SCHOOLS INFLUENZA
PANDEMIC MANAGEMENT



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Assistant Superintendent

WAYNE HOLLIDAY

Business Administrator/Board Secretary

Tel: 732-521-2111

Dear Parents/Guardians:

Middlesex County health officials have declared the pandemic flu is under control. Our school will open again on _____. At this time, students may safely return to class.

Even though school is opening, there are still some people who are sick from the flu virus. Health officials say that pandemic flu outbreaks sometimes happen in waves. This means more people could become sick soon again. If more people get sick, schools may need to close again. We will continue to give you any important information.

Because the flu can still be spread from person-to-person, please keep children who are sick at home. Don't send them to school.

We are looking forward to seeing your children again.

Yours for the sake of all children,

Dr. Kenneth R. Hamilton
Superintendent of Schools

MONROE TOWNSHIP SCHOOLS INFLUENZA
PANDEMIC MANAGEMENT

D. TIPS FOR PARENTS ON COPING WITH PANDEMIC FLU

Plan for an extended stay at home during a flu pandemic.

- Ask your employer about how business will continue during a pandemic.
- Ask your employer if you can work from home during a flu pandemic.
- Plan for a possible reduction or loss of income, if you are unable to work or your place of employment is closed.
- Check with your employer or union about leave policies.
- Plan home learning activities and exercises. Have materials, such as books, on hand.
- Plan recreational activities that your children can do at home.
- Ask the school administration how lessons will be conducted/resumed in the event of school closures.

Items to have on hand for an extended stay at home:

Examples: Non-Perishable Foods	Health and Emergency Supplies
Ready to eat canned meats, fruits, vegetables, soups	Prescribed medical supplies such as glucose and blood pressure monitoring
Protein or fruit bars	Soap and water or alcohol based hand wash
Dry cereal or granola	Medicines for fever, such as acetaminophen (Tylenol) or ibuprofen (Advil)
Peanut butter and jelly	Thermometer
Dried fruit, nuts, trail mix	Vitamins
Crackers	Fluids with electrolytes, such as Pedialyte®
Canned juices	Flashlight with extra batteries
Bottled water	Portable radio with extra batteries
Canned or jarred baby food	Manual can opener
Baby formula	Garbage bags

MONROE TOWNSHIP SCHOOLS INFLUENZA PANDEMIC MANAGEMENT

If someone in your home develops flu symptoms (fever, cough, muscle aches):

- ✓ Encourage plenty of fluids to drink.
- ✓ Keep the ill person as comfortable as possible. Rest is important.
- ✓ For adults with fever, sore throat and muscle aches, use ibuprofen (Advil) or acetaminophen (Tylenol).
- ✓ Do not use aspirin in children or teenagers; it can cause Reye's syndrome, a life-threatening illness.
- ✓ Sponging with tepid (wrist-temperature) water lowers fever only during the period of sponging. Do not sponge with alcohol.
- ✓ Keep tissues and a trash bag for their disposal within reach of the patient.
- ✓ All members of the household should wash their hands frequently.
- ✓ Keep other family members and visitors away from the person who is ill.
- ✓ Contact a healthcare provider for further advice. If the ill person is having difficulty breathing or is getting worse, contact the healthcare provider right away.

For more information, call your healthcare provider or visit the Middlesex County Board of Social Services' website at:

middlesexcwa.newark.rutgers.edu/programs.html or visit the federal government's pandemic flu website: <http://www.pandemicflu.gov>

E. Reactions to Stress

Crisis Response Network

During the next few days, you may at some time experience one or more of these normal reactions to stress. The key to managing stress is to recognize these common symptoms:

Physical Reactions	Cognitive Reactions	Emotional Reactions	Behavioral Reactions
Fatigue/exhaustion Insomnia Sleep disturbances Over/Under activity Nightmares Change in appetite Digestive problems Physical problems Headaches Nausea	LACK OF CONCENTRATION Flashbacks Difficulty with decisions Memory disturbance AMNESIA Confusion Poor problem solving Disturbed thinking Poor abstract thinking Change in alertness	Fear Guilt Emotional numbing Over sensitivity Anxiety Depression Feeling helpless Anger Irritability Frustration	Change in activity Change in communication Withdrawal Suspiciousness Hyperalertness Startle reflex Change in sexual behavior Emotional outbursts Scapegoating Pacing

Remember that these reactions to stress are normal. In order to combat these identified symptoms here are some things to try that are known to lessen or alleviate stress:

Things to try:

- ◆ Within the first 24 - 48 hours, periods of strenuous physical exercise alternated with relaxation will alleviate some of your physical reactions.
- ◆ Structure your time - keep busy.
- ◆ You're normal and having normal reactions - don't label yourself as crazy.
- ◆ Talk to people - talk is the most healing medicine.
- ◆ Beware of numbing the pain with drugs or alcohol. You don't need to complicate this with a substance abuse problem.
- ◆ Reach out - people do care.
- ◆ Keep your lives as normal as possible.

MONROE TOWNSHIP SCHOOLS INFLUENZA
PANDEMIC MANAGEMENT

- ◆ Spend time with others.
- ◆ Help those around you as much as possible by sharing feelings and checking out how they are doing.
- ◆ Give yourself permission to feel rotten.
- ◆ Keep a journal - write your way through those sleepless hours.
- ◆ Do things that feel good to you.
- ◆ Realize that those around you are under stress.
- ◆ Accept offered help.
- ◆ Eat nutritious, well-balanced meals high in carbohydrates and low in sugar.
- ◆ Avoid excessive use of caffeine.
- ◆ Don't make any big life changes.

APPENDIX C – Definition of Surveillance Levels

A. Standard Surveillance

No flu activity reported in the community (flu season)

- Monitor daily attendance for increased reports of absence due to flu-like illness.
- Do not report absences to the Health Department unless greater than 10%.

B. Heightened Surveillance

Flu activity reported in the community (less than 10% school absenteeism due to flu-like illness)

- Monitor daily attendance for flu-like illness/absences.
- Begin morning 'flu check' first hour of school – screen those who report positive for symptoms.
- Log absences due to flu-like illness.
- Send weekly absence report (via fax) to Health Department.

C. Intensive Surveillance

High number of flu illness reported in the community (10% or greater school absenteeism due to flu-like illness)

- Monitor daily attendance and log absences on log sheet.
- Continue morning 'flu check'.
- Send daily absence report (via fax) to Health Care Agency.
- Begin preparation for potential school closure.



MIDDLESEX COUNTY PUBLIC HEALTH DEPARTMENT

John Pulomena
Chairman

David A. Papi
Director

Influenza/Absentee Surveillance Form - School

Instructions: Complete this form each Tuesday using that day's absenteeism figures (NOT weekly calculations).

Fax this form by noon on Wednesday to Somini John at (732) 745-2568
or e-mail to Somini.John@co.middlesex.nj.us

1. Surveillance date: Tuesday, _____.

2. Name of School: _____

3. City/County: _____

4. Total student population: _____

5. Number absent on surveillance date: _____

6. Comments:

Thank you!

Somini Mathew John, MPH

Public Health Emergency Notification Coordinator
Middlesex County Public Health Department
Division of Public Health Preparedness and Epidemiology
John F. Kennedy Square, 5th Floor
New Brunswick, NJ 08901

Work Phone (732) 745-8923
Fax number (732) 745-2568

C. Daily Pandemic Flu Census Log EXAMPLE

Once pandemic flu has been confirmed as present in Middlesex County, use this form (or an equivalent) to log student absences.

Student Name	Illness is Influenza?	Absent?
TOTALS		

MONROE TOWNSHIP SCHOOLS INFLUENZA
PANDEMIC MANAGEMENT

D. Nurses Letter

David B. Crabiel
Freeholder Director

Stephen J. Dalina
Deputy Director

Camille Fernicola
H. James Polos
John Pulomena
Christopher D. Rafano
Blanquita B. Valenti
Freeholders



**COUNTY OF MIDDLESEX
PUBLIC HEALTH DEPARTMENT
ADMINISTRATION BUILDING 5TH FLOOR
JOHN F. KENNEDY SQUARE
NEW BRUNSWICK, NJ 08901-3605**

John Pulomena
Chairman

David A. Papi
Director

(732) 745-3100
Fax (732) 745-2568

May 23, 2007

Dear School Nurses,

The Middlesex County Public Health Department along with twenty-one other local health agencies and the New Jersey State Department of Health and Senior Services utilize a sophisticated communication system called the Local Information Network and Communication System (LINCS) to promptly disseminate critical health alerts and information throughout the State.

School nurses play a critical role in community health. It is important that all school nurses receive up-to-date information and critical alerts pertaining to their communities and the health of the students they care for. We would like each of you to participate in this communication system.

In addition to the communication system, we would also like you to participate in an important public health surveillance project. The Epidemiology Division of the Middlesex County Public Health Department would like to begin collecting weekly absentee data from schools in Middlesex County. We will be compiling this data and utilizing it for our Active Influenza Surveillance program and as a method for early detection of any abnormal disease occurrences.

We are very eager to gain the cooperation of local school nurses for communication and surveillance projects. Please contact me at your earliest convenience by phone at 732-745-8923 or email at stephanie.brown@co.middlesex.nj.us

Sincerely,

Stephanie A. Brown
Middlesex County Public Health Department

**MONROE TOWNSHIP SCHOOLS INFLUENZA
PANDEMIC MANAGEMENT**

E. Middlesex County Local Health Departments

County	Health Department/Address	Health Officer	Phone/Fax/Email/Web Site
MIDDLESEX COUNTY	Middlesex County Public Health Dept John F. Kennedy Square-5th Floor New Brunswick, NJ 08901	David A Papi Director	Phone: 732-745-3100 Fax: 732-745-3922 Email: dpapi@superlink.net Website: co.middlesex.nj.us/publichealth Serving: Carteret Cranbury Dunellen East Brunswick Helmetta Highland Park Jamesburg Metuchen Milltown Monroe Twp New Brunswick North Brunswick Old Bridge Perth Amboy Plainsboro Sayreville South Amboy South Plainfield South River Spotswood
MIDDLESEX COUNTY	Middle-Brook Regional Health Commission Boro Hall 1200 Mountain Avenue Middlesex, NJ 08846-1200	Kevin G. Sumner, M.P.H. Health Officer	Phone: 732-356-8090 Fax: 732-356-1249 Email: mbrhc@superlink.net Website: www.middlebrookhealth.org Serving: Bound Brook (Somerset Co.) Green Brook Twp (Somerset Co.) Middlesex Boro South Bound Brook (Somerset Co.) Warren Twp (Somerset Twp) Watchung (Somerset Co.)
MIDDLESEX COUNTY	Piscataway Township Health Dept 455 Hoes Lane Piscataway, NJ 08854-5097	Andrew C. Simpf, Jr., M.A. Health Officer	Phone: 732-562-2323 Fax: 732-743-2500 Email: asimpf@piscatawaynj.org Web site: http://www.town.piscataway.nj.us/Departments.asp Serving: PISCATAWAY

**MONROE TOWNSHIP SCHOOLS INFLUENZA
PANDEMIC MANAGEMENT**

MIDDLESEX COUNTY	Edison Dept of Health & Human Resources Municipal Complex 100 Municipal Boulevard Edison, NJ 08817-3353	John O. Grun, M.S. Health Officer	Phone: 732-248-7290 Fax: 732-248-0494 Email: health@edisonnj.org Website: www.edisonnj.org Serving: Edison
MIDDLESEX COUNTY	South Brunswick Health Department 540 Ridge Road (Route 522) PO Box 190 Monmouth Junction, NJ 08852	Stephen J. Papenberg Health Officer	Phone: 732-329-4000, Ext. x 7237 Fax: 732-329-4168 Email: spapenbe@sbttnj.net Website: www.twp.south-brunswick.nj.us/DepIndex.asp Serving: Rocky Hill (Somerset Co) South Brunswick
MIDDLESEX COUNTY	Woodbridge Twp Dept of Hlth & Hum Svcs 2 George Frederick Plaza Woodbridge, NJ 07095	Dennis M Green Dir of Health and Human Svcs	Phone: 732-855-0600, Ext. x 5026 Fax: 732-855-0887 Email: dennis.green@twp.woodbridge.nj.us Serving: Woodbridge

MONROE TOWNSHIP SCHOOLS INFLUENZA
PANDEMIC MANAGEMENT

PRESS RELEASE

A. Schools Remain Open

To announce that schools remain open.

For release (DATE)

Contact: Dr. Kenneth R. Hamilton, Superintendent of Schools
732-521-2111

MONROE TOWNSHIP SCHOOLS ARE despite the pandemic flu outbreak in the county. However, parents are asked to prepare for possible closures if the virus continues to spread.

School and county health officials are working together to monitor the situation and parents will be updated with any important information.

"At this time, we believe students can safely attend classes and schools will remain open. Our thoughts are with all of our families and children who are affected," said (health official)

- If the pandemic flu continues to spread and more students become ill, health officials say they may need to order schools closed for a period of time. They urged parents to begin planning now for childcare in their home.
- Health officials say parents can help protect their children and prevent the spread of pandemic flu as they would colds and other flu by taking the following precautions:
 - Teach your children to wash hands frequently with soap and water for 20 seconds. Be sure to set a good example by doing this yourself.
 - Teach your children to cover coughs and sneezes with tissues or by coughing into the inside of the elbow. Be sure to set a good example by doing this yourself.
 - Teach your children to stay at least three feet from people who are sick. People who are sick should stay home from work or school and avoid other people until they are fever free for a minimum of 24 hours and illness symptoms are dramatically improved.

Health officials point out that recommendations may change during the course of a pandemic flu outbreak. For school updates, parents can call the school district's hotline at (732) or go to the District's website at www.monroe.k12.nj.us

For more information on pandemic flu, visit the Middlesex County Department of Health website at <http://co.middlesex.nj.us/publichealth> the federal government website at www.pandemicflu.gov

MONROE TOWNSHIP SCHOOLS INFLUENZA
PANDEMIC MANAGEMENT

B. Schools Closed Press Release

To announce school closures a similar press release will be issued when school reopens.

For release (DATE)

Contact: Dr. Kenneth R. Hamilton, Superintendent of Schools
732-521-2111

HEALTH OFFICIALS ORDER CLOSURE OF SCHOOLS IN MIDDLESEX COUNTY

Middlesex County health officials have ordered the closure of schools as a result of the pandemic flu outbreak in the county.

Schools may be closed for a period of time - days or even weeks. Because the virus is easily spread from person-to-person, the Middlesex County Health Care Agency has also ordered colleges, day care centers and preschools to close. Because it is unsafe for large groups of people to gather, health officials warn people to stay away from shopping malls, community centers and other places where germs can be spread.

"We know this is an anxious time for our community and our hearts go out to those who are ill. We are working closely with the schools to deal with the situation and will keep parents updated with any important information," said (Local Health Official)

According to LOCAL HEALTH OFFICIAL, the purpose of closing schools is to limit contact among children to decrease their risk of getting sick and to limit the spread of infection.

Because so many people are sick with the flu, health officials acknowledge that it may be hard to get a doctor's appointment, go to a clinic or even be seen in a hospital emergency room. They provided some tips for residents to care for the sick at home:

- Have them drink a lot of liquid (juice, water)
- Keep the sick person as comfortable as possible. Rest is important.
- For adults with fever, sore throat and muscle aches, use ibuprofen (Advil) or acetaminophen (Tylenol). Do not use aspirin in children or teenagers; it can cause Reye's syndrome, a life-threatening illness.
- Keep tissues and a trash bag within reach of the sick person.
- Be sure everyone in your home washes their hands frequently.
- Keep the people who are sick with the flu away from the people who are not sick.

**MONROE TOWNSHIP SCHOOLS INFLUENZA
PANDEMIC MANAGEMENT**

More information on pandemic flu is available on the Monroe Township District website at www.monroe.k12.nj.us or by calling the District hotline at (732) 326-7322

MONROE TOWNSHIP SCHOOLS INFLUENZA
PANDEMIC MANAGEMENT

C. SAMPLE KEY MESSAGES FOR SCHOOL OFFICIALS

1. OUTBREAK PRESS RELEASE

- We know this is an anxious time for our community and our hearts go out to those who are ill. We are working closely with local health officials to deal with the situation and will keep parents updated with any important information.
- At this time, under the guidance of the county health department, we believe students can safely attend classes and schools will remain open. Our thoughts are with all of our families and children who are affected.
- If pandemic flu continues to spread and more students become ill, health officials may need to close schools for an extended period of time (for example, up to 6 weeks).
- The purpose of closing schools will be to decrease contact among children in order to decrease their risk of getting sick and to limit the spread of infection. If schools are closed, children should stay at home.
- We urge parents to plan now for the possibility of schools closing. Arrange day care, and home instruction based on the schools policy.
- Parents can help protect their children and prevent the spread of pandemic flu as they would colds and other flu by taking the following precautions:
 - Teach your children to wash hands frequently with soap and water for 20 seconds. Be sure to set a good example by doing this yourself.
 - Teach your children to cover coughs and sneezes with tissues or by coughing into the inside of the elbow.
 - Teach your children to stay away from people who are sick and stay home from work or school if you are sick.

Recommendations may change during the course of a flu pandemic. We will make public announcements through the media and parents can call the school district's hotline at (732) .

For more information on pandemic flu, visit the Middlesex County Department of Health website at <http://co.middlesex.nj.us/publichealth> the federal government website at www.pandemicflu.gov

MONROE TOWNSHIP SCHOOLS INFLUENZA
PANDEMIC MANAGEMENT

2. SCHOOL CLOSURES PRESS RELEASE

Middlesex County health officials have ordered the closure of schools as a result of the pandemic flu outbreak in our county.

Schools may be closed for an extended period of time (for example, up to 6 weeks).

We know this is a difficult time for our community and our hearts go out to those who are ill. We are working closely with health officials to deal with the situation and will keep parents updated with any important information.

Because pandemic flu is easily spread from person-to-person, it is unsafe for large groups of people to gather and children should stay home. The purpose of closing schools is to decrease contact among children in order to decrease their risk of getting sick and to limit the spread of infection.

During this time, children and adults should stay away from other people and groups, as much as possible. Health officials also advise people should not gather in other locations such as homes, shopping malls, movie theaters or community centers.

Parents can help protect their children and prevent the spread of pandemic flu as they would colds and other flu by taking the following precautions:

- Teach your children to wash hands frequently with soap and water for 20 seconds. Be sure to set a good example by doing this yourself.
- Teach your children to cover coughs and sneezes with tissues or by coughing into the inside of the elbow.
- Teach your children to stay at least three feet from people who are sick, and stay home from work or school if you are sick.

Recommendations may change during the course of a flu pandemic. We will make public announcements through the media, and parents can call the school district's hotline at (INSERT NUMBER)

For more information on pandemic flu and prevention, visit the _____
_____ website at _____ or call the _____
_____ at: _____.



MONROE TOWNSHIP SCHOOLS
423 Buckelew Avenue
Monroe Township, New Jersey 08831
www.monroe.k12.nj.us

KENNETH R. HAMILTON, Ed.D.

Superintendent of Schools

JEFF GORMAN

Assistant Superintendent

WAYNE HOLLIDAY

Business Administrator/Board Secretary

Tel: 732-521-2111

Dear Parents/Guardians:

Middlesex County health officials have ordered all schools in the County to close. This order is because of the pandemic flu situation here. All schools are immediately closed until further notice and children should stay home.

Schools may be closed for days or even weeks to reduce contact among children and stop the spread of the flu.

We know that many students and their families are very sick. We know this is a hard time for our community and our hearts go out to those who are ill.

Because the flu is easily spread from person-to-person, it is not safe for large groups of people to gather. During this time, both children and adults should stay away from other people and groups as much as possible. They should not gather in locations such as shopping malls, movie theaters or community centers.

We know that it may be hard to get a doctor's appointment, go to a clinic or even be seen in a hospital emergency room. Here are some tips for helping those who are sick with the flu:

- Have them drink a lot of liquid (juice, water).
- Keep the sick person as comfortable as possible. Rest is important.
- For fever, sore throat and muscle aches, use ibuprofen (Advil) or acetaminophen (Tylenol). Do not use aspirin with children or teenagers; it can cause Reye's syndrome, a life-threatening illness.
- Keep tissues and a trash bag within reach of the sick person.
- Be sure everyone in your home washes their hands frequently.
- Keep the people who are sick with the flu away from the people who are not sick.

For more information, call your healthcare provider or visit the Middlesex County Health Care Agency' website <http://co.middlesex.nj.us/publichealth>. Or call the school hotline at (732) 521-2882 ext. 1701 or visit the District website at www.monroe.k12.nj.us.

We will contact you as soon as we have information about when school will reopen.

Yours for the sake of all children,

Dr. Kenneth R. Hamilton
Superintendent of Schools

KRH:cv



MONROE TOWNSHIP SCHOOLS
423 Buckelew Avenue
Monroe Township, New Jersey 08831
www.monroe.k12.nj.us

KENNETH R. HAMILTON, Ed.D.

Superintendent of Schools

JEFF GORMAN

Assistant Superintendent

WAYNE HOLLIDAY

Business Administrator/Board Secretary

Tel: 732-521-2111

Dear Parents/Guardians:

Middlesex County health officials have declared the pandemic flu is under control. Our school will open again on _____. At this time, students may safely return to class.

Even though school is opening, there are still some people who are sick from the flu virus. Health officials say that pandemic flu outbreaks sometimes happen in waves. This means more people could become sick soon again. If more people get sick, schools may need to close again. We will continue to give you any important information.

Because the flu can still be spread from person-to-person, please keep children who are sick at home. Don't send them to school.

We are looking forward to seeing your children again.

Yours for the sake of all children,

Dr. Kenneth R. Hamilton
Superintendent of Schools

KRH:cv



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Estimados Padres/Guardianes:

Esta carta le ayudara a su familia prepararse para la gripe pandémica que podría enfermar a muchas personas.

Es importante saber que a horita, no hay gripe pandémica de ninguna clase en los Estados Unidos. A horita tampoco hay gripe aviar/de aves en los Estados Unidos.

Oficiales de la Salud Pública están preocupados de que el virus de la gripe aviar/de aves se cambie y así pueda infectar a las personas y pasarse fácilmente de persona-a-persona. Esto causaría un brote llamado pandémica.

Oficiales de Salud Pública quieren que las personas se protejan de la gripe pandémica.

Estas son unas formas de cómo proteger a su familia:

- Mantenga a los niños enfermos en casa. No los mande a la escuela.
- Enséñele a sus hijos a lavarse las manos frecuentemente con agua y jabón por un mínimo de 20 segundos. Asegúrese de dar un buen ejemplo por haciendo usted lo mismo.
- Enséñele a sus hijos a taparse la tos y estornudo o que estornuden dentro del codo. Asegúrese de dar un buen ejemplo haciendo usted lo mismo.
- Enséñele a sus hijos que se mantengan por lo menos tres pies de distancia de personas que estén enfermos.
- Personas que están enfermas no deben ir al trabajo o a la escuela y deben evitar otras personas hasta que se mejoren.

Incluido con esta carta es una lista para ayudarle a las familias a prepararse para un brote de gripe pandémica. Esta información también le puede ayudar a su familia a prepararse para cualquier tipo de emergencia.

Si tiene preguntas, favor de contactar a su Enfermera de Escuela o proveedor de cuidado de salud. Puede llamar a la línea telefónica de la escuela al (732) 521-2882 ext. 1701.

Visite Monroe Township www.monroe.k12.nj.us

Visite la Red al <http://www.redcross.org>.

El sitio Red del gobierno federal tiene información sobre planificación para personas y familias:
<http://www.pandemicflu.gov>
Cruz Roja Americana

Sinceramente suyo,

Dr. Kenneth R. Hamilton
Superintendent of Schools

KRH:cv

**Monroe Township School District
423 Buckelew Avenue
Monroe Twp, NJ 08831**

**Continuity of Student Learning and
Core Operations Plan in the event of a Pandemic**

District Name	Monroe Township	County	Middlesex
Chief School Administrator	Dr. Kenneth R. Hamilton Superintendent	Chief School Administrator Designee	Mr. Jeff Gorman Assistant Sup't
# of students	5131	# of Personnel	813
# of schools	6	Off Site Location	
County Superintendent	Dr. Patrick Piegari	Contact Number(s) & Email(s)	732-249-2900 P.piegari@doe.state.nj.us
Law Enforcement	Monroe Twp Chief of Police John Kraivec	Contact Number(s) & Email(s)	732-521-0222 x 122
Office of Emergency Management	Middlesex County Rory Zach	Contact Number(s) & Email(s)	732-727-9009 x 7103
Public Health Office	William Gardner (MT) Lee Dauphinee (MC)	Contact Number(s) & Email(s)	732-521-4400 732-745-8480

Purpose:

The purpose of this planning guide is to identify critical functions and resources for providing continuity of instruction in the event of prolonged school closings caused by natural or manmade disaster, an epidemic, pandemic, or some unforeseen circumstance.

1. Critical Functions

a. Providing continued instruction- Regular Education

1-10 days: Each district school will make efforts to provide continued instruction to students in the following core content areas: Math, Science, Social Studies, Language arts/Literacy and World Languages. Continued instruction will be provided by mailing assignments home to affected families via postal service, e-mail and/or web postings. District supervisors will be responsible for coordinating this process within their respective departments.

More than 10 days: The district is exploring the implementation of distance learning providers such as *Educere*. The chief school administrator will direct the implementation of such an initiative if necessary, in consultation with the administration, guidance staff, and technology staff.

b. Providing continued instruction- Students with Disabilities

1-10 days: The Director of Pupil Personnel and the Supervisor of Special Education will make efforts to provide appropriate services to special needs students according to their IEP's. This may entail home instruction and/or transporting students to other facilities such as Middlesex County Special Services.

More than 10 days: The Director of Pupil Personnel and the Supervisor of Special Education will make every effort to continue home instruction if possible, which may necessitate mandating district staff to serve as home instructors.

c. Student Assessment

Student assessment will be directed and coordinated by the district supervisors in consultation with central administration. Assessment measures may include online tests, or requiring students to send completed work via postal services or email

2. Emergency Notification

a. Staff:

Each district school principal has a flash drive with a staff directory stored. The superintendent also maintains an electronic staff contact list. Each faculty/staff member has a copy of an emergency notification tree. Each building administrator has a copy and Central Office has a copy at: **423 Buckelew Avenue Monroe Twp, NJ 08831**

b. Student/ Family Notification:

Emergency announcements to students and families would be broadcast via the district web site, email, and the districts automatic phone notification system, *GlobalConnect*, as well as local news and radio. The district is currently expanding the *GlobalConnect* system to broadcast emergency notification via email

3. Equipment needs

- a. Data stored on district servers are backed up and stored offsite. The Central Office server is also backed up and data stored off site, along with payroll information. This process is coordinated by the Network Administrator. The district is exploring purchasing a "Pocket SASI" PDA on which daily backups of our Student Information systems data may be stored and carried offsite.

4. Mail:

In the event of interrupted mail delivery, essential communication from state officials will be disseminated via the Office of Emergency Management, most likely through email or telephone

5. Document Handling

Our schools have most critical forms available electronically which could be accessed from any of our schools, or remotely through file backups.

Most forms can be accessed electronically at all seven schools and the Central office. These documents could be made available remotely via the Network administrator. Student records are archived electronically, and the district is exploring electronic storage and archiving solutions for all personnel records.

Genesis and PayServ (Personnel and Payroll) can be accessed remotely. Network backup and archiving software and servers are essential.

6. Access to Information

The Director of Information Systems, Reggie Washington maintains an inventory list. The inventory list is also on a network directory.

**Note: Code your responses, i.e., "E=Electronic or Not E=Not Electronic, L=Long or S=Short" to avoid repetition.*

7. Staff Unavailable

If large numbers of staff are unavailable (more than half/less than half) what essential functions would not be carried out? Put on ½ day schedule – No food service, Electives would not be in session, Possibly no after school activities..

8. Delegation

Identify an authority or function that could be delegated elsewhere, both within your district and outside, to

Superintendent Dr. Kenneth R. Hamilton
Assistant Superintendent Mr. Jeff Gorman

9. Emergency Training

- a. To what extent could other personnel be trained to carry out a critical function?
- b. What resources (qualified personnel, materials, time) would be necessary?
- c. Which of your personnel could be field trained to complete critical functions in an emergency? School Nurse, Resource Officer, Athletic Trainer, Student Assistance Counselor, EMT Team.

10. One Day Function Interruption

If circumstances caused a resource interruption of only ONE day, comment upon each of these areas:

- a. Critical Functions – What function(s) could not cease even for only one day? Food service.
- b. What resources (people, space, files/information, forms, documents, etc.) will you need to carry out that critical function – BE SPECIFIC AND DETAILED. Are there others who could carry out this function(s)? Could it be carried out without mail support, computer equipment/software (what are your needs)? What minimal number of staff would you need to carry those critical functions out? (Please identify who those individuals are.)

Monroe Township Schools
Pandemic Influenza Planning
June 2006

There has been much in the media and notifications from the state department of education surrounding Avian Pandemic Influenza. While there is no influenza pandemic anywhere in the world currently, the anticipation that such a flu is possible, even likely, warrants preparation by the school community. Our preparation included representation at the New Jersey Pandemic Influenza Summit held at Rutgers University on May 31, 2006.

Following are listed areas of concern, requiring attention from district personnel in anticipation of illness and absence due to influenza.

AREA	RESPONSIBILITY	ACTIVITIES
Personnel	Dr. Kenneth R. Hamilton Superintendent Mr. Joseph King Director of Pupil Personnel Services	<ul style="list-style-type: none">• anticipate absences of staff up to 40%• consider tiered system of reporting• consider competition for subs with other districts• consider possibility of absence due to "fear" of contagion• establish surveillance system of absences and establish "tipping point" for deciding school closings• discuss scenarios of the needs of staff without sufficient personal illness, family illness days• anticipate percentage of fatalities among staff• consider discussions with association groups around the issues of staff wellness, illness, fear (i.e. nurse/custodian practices; absence protections; makeup time for extended school closings; "credit" for work from home
Facilities	Jerry Tague	<ul style="list-style-type: none">• safety coverage of schools due to staff absences• meeting discussion and reminders about use of universal precautions and sanitizing efforts during clean up

		<ul style="list-style-type: none"> • anticipating annual manpower needs (i.e. snow removal) in light of absences • assure stockpiling of sanitary supplies before the "rush" caused by the imminence of illness
Transportation	Ingrid Reitano	<ul style="list-style-type: none"> • staffing coverage for drivers and aides • coverage of contracted routes affected by absences • bus sanitizing (a.m. and p.m.) • effect of illness of high risk students on transportation staff • anticipation of mechanic illness fuel delivery delays, etc. • consider policy for the transportation of sick children
Business Office	Wayne Holliday	<ul style="list-style-type: none"> • allocation of funds for the purchase/stockpiling of tissues, gloves, masks, hand sanitizers, etc. • assure operation of payroll and accounts payable departments • plan to meet with staff from Chartwells to discuss food safety, food preparation, provision of meals to free/reduced families if schools are closed
Food Services	Nancy Mitrocsak	<ul style="list-style-type: none"> • The district will follow strict guidelines for food safety using HACCP procedures. Additional steps will be taken to minimize direct contact with people. Employees should wash hands frequently, and added safety materials such as disposable gloves and masks should be allocated to employees in direct contact with customers. • Established emergency communications will be followed as outlined in the districts bio-security plan.

		<ul style="list-style-type: none"> • The workplace will be monitored for employees who have been exposed to pandemic influenza, are suspected to be ill or become ill at the worksite. Sick leave should be taken for any employee who is ill or suspected of being ill. When a previously ill person is no longer infectious and can return to work, the district may require a full release from a physician. • Communicate and educate employees. Develop and disseminate materials covering pandemic fundamentals, personal and family protection, and response strategies.
Student Services	Joseph King	<ul style="list-style-type: none"> • prepare documents and opportunities for discussion among administrative staff prior to the end of the school year and for August administrative meetings • meet with health services staff to review hygiene communication, exclusion and reporting practices • meet with mental health staff to review anticipated flu effects-fear, illness and death of family members, students and staff • identify vulnerable populations and discuss plans to assist • discuss methods for identifying families or family members traveling between high risk global areas and Monroe Township • use CRT as the community committee to discuss community preparation (health, clergy, police) • consider cultural needs of students, families and staff during illness

Curriculum	Mr. Jeff Gorman, Assistant Superintendent	<ul style="list-style-type: none"> • consider ways to continue to deliver curricula in the event of increasing absences and school closings • identify remote instructional sources and produce paper copies of support material to be used by families to maintain levels of instruction
Community Education	Mr. Jeff Gorman, Assistant Superintendent	<ul style="list-style-type: none"> • consider ways to monitor student illness among families • consider financial impact on before/after school programs, holiday camps and community education courses and programs due to staff and student absences
Public Information Office	Dr. Kenneth R. Hamilton, Superintendent	<ul style="list-style-type: none"> • prepare information bulletins for staff and parents in concert with other district staff • meet with media to have them assist in communicating about preparedness • establish district web link on Pademic Flu to provide current and accurate information to the community • meet to discuss how (cable channel) and channel 3 can be used for information and instruction • collect questions received by the district as a means of assessing community concerns, the nature of the concerns, and what can be done in response to address
Director of Technology	Reginald Washington	<ul style="list-style-type: none"> • discuss implications for the use of technology to access district functions with reduced staff or from home or other remote locations
Superintendent	Dr. Kenneth R. Hamilton	<ul style="list-style-type: none"> • prioritize district preparation activity and timelines for completion • influence communication among township manager, chief of police

		<p>and township health inspector to address an integrated plan</p> <ul style="list-style-type: none"> • serve as spokesperson for the district with the public through a variety of media or settings • keep the Board of Education informed of preparation activities and developing • discuss with township government the potential use of schools for immunization or triage/hospitalization activities • consider communication system and impact on extra curricular events (sports, band, etc) • prepare for the need for “social distancing” thus avoiding large group assemblies increasing likelihood of contagion • seek or develop liberal attendance waivers for students and staff • assure reliable communication practices throughout the district • support principals in their day-to-day challenges with most/all of the above
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This is the first draft on considerations, needs, and responsibilities related to the possibility of a pandemic flu outbreak.



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KENNETH R. HAMILTON, Ed.D.

Superintendent of Schools

JEFF GORMAN

Assistant Superintendent

WAYNE HOLLIDAY

Business Administrator/Board Secretary

Tel: 732-521-2111

Dear Parents/Guardians:

We wrote to you recently to tell you about a pandemic flu outbreak in our community. Here is some new information.

There are now even more students in our school who are ill with this flu virus. Still the county health department tells us that students who are not ill can continue to attend school. The schools will remain open. We will keep you updated with any important information.

(To keep the flu from spreading to more people, we ask you to keep sick children home. Any children who are sick in school will be sent home.)

Public health officials want you to protect yourself and your family against pandemic flu. Here are some ways to stop the spread of germs and sickness and take care of your family

- Keep children who are sick at home. Don't send them to school.
- If some of the people in your home are sick with the flu, keep them away from the people who are not sick.
- If some of the people in your home are sick with the flu and you cannot see a health provider, some things you can do to help them are:
 - Have them drink a lot of liquid (juice, water)
 - Keep the ill person as comfortable as possible. Rest is important.
 - For fever, sore throat and muscle aches, in adults, use ibuprofen (Advil) or acetaminophen (Tylenol). Do not use aspirin with children or teenagers; it can cause Reye's syndrome, a life-threatening illness.
 - Keep tissues and a trash bag within reach of the sick person.
 - Be sure everyone in your home washes their hands frequently.
 - Contact a healthcare provider for further advice. If the ill person is having difficulty breathing or is getting worse, contact the healthcare provider right away.

Please visit the District website at www.monroe.k12.nj.us for more information.

If the pandemic flu continues to spread and more students become ill, schools may close for days or weeks. The purpose of closing schools will be to keep children from getting sick. If schools are closed, children should stay at home. Begin planning now for childcare in your home.

Yours for the sake of all children,

Dr. Kenneth R. Hamilton
Superintendent of Schools

Sample Plans

- Grade 4 Independent Reading Contract
- Grade 7 Mathematics
- Grade 12 Laboratory Chemistry

are attached to this Plan. However, complete Plans for closure Day 1-5 and 6-10 are available online. Teacher availability Schedule to be determined as needed in the event of closure.



Week 1 (Days 1-5)



Independent Reading Contract

This week's lessons will include some reading, writing, skill building and art connected activities. You will be allowed to choose a book of your choice. The activities on the contract will be chosen according to your interest. Happy Reading!

Let's get started:

1. **CHOOSE A BOOK:** Visit the library, go to a bookstore, or find a book on your own bookshelf. Your book should be from the genre of fiction. A picture book at grade level or chapter book between 75-120 pages should be great to complete your contract. Think of the following questions when choosing a book:
 - a. What is this book about?
 - b. Does the subject interest me?
 - c. Can I read the book without too much difficulty?
2. **REVIEW THE CONTRACT:** Plan out which activities interest you. Complete the activities based on your independent reading book. When you are finished with the activity, check the box. (Day 1)
3. **READ YOUR BOOK:** As you read, think of the activities that you may complete. Take notes or write your thoughts in a journal to help you complete the contract. (Day 1- picture book) (Days 1 - 5, if you are reading a chapter book)
4. **COMPLETE YOUR CONTRACT:** Remember to review your work and complete the Self-Assessment Rubric (Days 1- 5)


Name _____

Independent Reading Contract

Book Title: _____

This book was: (easy) 1 2 3 4 5 (difficult)

Directions: Complete the activities based on your independent reading book.
Remember to cross out the box when you have finished an activity.

READING DO ALL 4	WRITING Choose 2	SKILLS Choose 1	ART Choose 1
BEFORE READING Think about why you choose to read this book. Write three reasons why you choose it.	*Write a letter about your book to your school Media Specialist. (Oak Tree- Mrs. Lange; Woodland- Ms. Kofke, Brookside- Mrs. Kurak)	* Accelerate with action verbs from your book.	Design a CD cover from your book. Think of a song title that relates to your book. Cover a plastic CD holder with your creation to share with your class.
DURING READING Write a prediction about the ending.	*Recommend your book to three famous people. (Maybe George Washington or J.K. Rowlings)	*Set up with new vocabulary words.	Imagine that your class is putting on a play based on your book. Make a poster to advertise your play.
AFTER READING Share your favorite parts with a family member. Explain why they were your favorite.	*Write a character wish list.	*Find some awesome adverbs in your book that make your verbs come to life. <i>slowly nibbled</i>	Create a caricature or exaggerated portrait of a character in your book. Write a description of your character beneath your drawing. 
AFTER READING *Complete a Conclusion Fiction form	*Research about the author. Write the information you found on Meeting the Author.	*Create and play Proper and common noun concentration.	Draw a comic strip that sequences the events in your book. Include at least 5 pictures.

*An activity marked with an asterick has an attached sheet for completion.

LETTER TO YOUR MEDIA SPECIALIST

Write a letter to your school Media Specialist. Explain why a Media Specialist should or should not recommend this book for other children to read. Include specific details about the book and why students your age would or would not enjoy reading it.

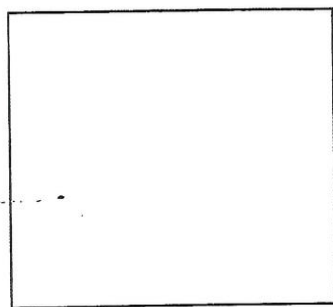
The writing area is enclosed in a large rectangle and contains several sets of horizontal lines for text entry. Each set consists of a solid top line, a dashed middle line, and a solid bottom line. There are four such sets of lines, providing ample space for a letter. The first set of lines is positioned near the top of the box, and the last set is near the bottom.

Famous Recommendations

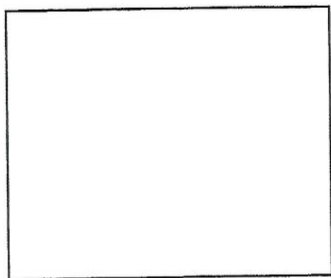
Think of three famous people who might enjoy your book. They can be from any time period or any country.

Draw a picture of each person in the frames. Then write why you recommend the book to each of them.

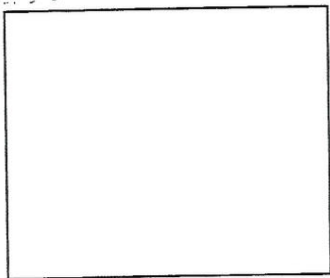
Remember to include specific reasons why you are recommending this book.



Famous Person



Famous Person



Famous Person

Character Wish List

Make a list of objects the main character might like to own. Think about the character's goals and what would help him or her achieve those goals. Also consider what your character likes to do. Beside each object, write a brief explanation of why the character would want it. Write as if you were the character.

MY WISH LIST

by: _____

character's name

OBJECTS

Why I want it.

ALL ABOUT THE AUTHOR

Look up information about the author by using the internet, information on the book cover, and/or research you completed at the library.

NAME: _____

BORN: _____ BIRTHPLACE: _____

CURRENT HOME STATE: _____

IMPORTANT EVENTS IN AUTHOR'S LIFE: _____

HOBBIES: _____

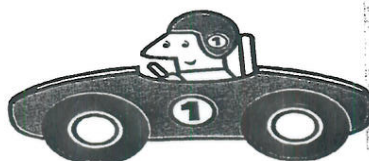
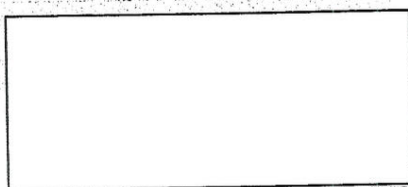
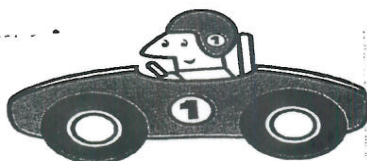
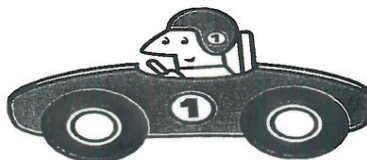
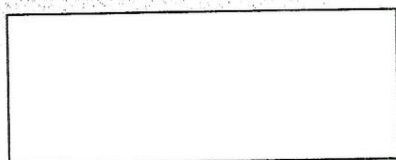
OTHER BOOKS BY THE SAME AUTHOR: _____

AUTHOR'S THOUGHTS ABOUT WRITING THIS BOOK: _____

OTHER INTERESTING INFORMATION ABOUT THE AUTHOR:

Accelerate With Action Verbs

Look in your book for interesting action words. Write each verb on a sign by the car. Write each word in your own sentence below.



1. _____
2. _____
3. _____
4. _____

Step Up Your Vocabulary

Find three new words in your book. Fill in the information in each box. You may fill in more sheets to step up your vocabulary even more!

WORD: _____	Definition: _____
Sentence in your book: _____	
_____ Synonym (s): _____	
Now my own sentence: _____	

WORD: _____	Definition: _____
Sentence in your book: _____	
_____ Synonym (s): _____	
Now my own sentence: _____	

WORD: _____	Definition: _____
Sentence in your book: _____	
_____ Synonym (s): _____	
Now my own sentence: _____	

AWESOME ADVERBS



While swimming, the larger fish *slowly nibbled* on its lunch.

An adverb is a word that describes a verb. Look in your book for interesting adverbs and write them on the left column. Write a sentence using each adverb. Underline each verb and circle the adverb it describes.

ADVERBS	SENTENCE

Illustrate one of your sentences below.

Name _____ Book Title: _____

Write your responses to the following questions. Be prepared to discuss your answers with your classroom teacher. Bring your book to school to share it with your classmates.

1. Who do you think is the most interesting character? Why?

2. What is the most difficult part of the book? What questions do you have about it?

3. What is the theme or main message of the book you read?

4. Choose an interesting passage or chapter from your book. Write your reasons why you liked this passage or chapter.

Conclusion Fiction Form

Name _____ Date _____

Book Title: _____

Self-Assessment Rubric

	1 Point	2 Points	3 Points	Score
PRESENTATION	Some of my work is neat and organized.	Most of my work is neat and organized.	All of my work is neat and organized.	
QUALITY OF MY WORK	Some of my work shows good thinking and understanding.	Most of my work shows great thinking and understanding.	All of my work shows incredible thinking and understanding.	
EFFICIENCY	I finished my work in a little time.	I finished my work in some amount of time.	I finished my work in a slowly and really demonstrated my best work.	

TOTAL SCORE I EARNED: _____

-PLEASE REMEMBER TO RETURN YOUR CONTRACT TO YOUR CLASSROOM TEACHER AS SOON AS POSSIBLE.



Mathematics Grade 7

Emergency Plans

Days 1-5

Directions:

1. Complete the "Designing a Flower Bed" project.
2. "Finding Perimeters and Areas of Quadrilaterals" worksheets. Show all your work.
3. "Finding the Circumference and area of Circles" worksheet. Show all your work.

Designing a Flower Bed



Situation:

Imagine that your school's PTA has donated \$500 toward the design of a new flower bed in the school courtyard. Your class has been chosen to provide the design and select the plants. The area for the flower bed is 30 feet by 40 feet and enjoys full to moderate sunlight. You will be given centimeter grid paper to create a scale drawing of your flower bed. You will also receive a list of possible plants and prices from which to choose. Your goal is to design an attractive flower bed at the best cost.

Follow these steps to complete your project:

1. Use the centimeter grid to sketch your design for the flower bed. Your flower bed can be any shape you'd like but it must be an efficient design for the plants you select.
2. Create a scale for your flower bed. A scale is a proportion in which a measurement on your drawing represents another measurement in real life. For example, 1 inch on a map may represent 200 miles in real life. Remember your flower bed must fit within an area of 30 feet by 40 feet.
3. Choose the plants you would like to place in your flower bed. Use "Facts and Prices of Selected Plants" as a reference. List the plants, quantity, and prices for each plant on the "Budget Recording Sheet" and keep a tally of the money you are spending. Remember you can only spend \$500 in total.
4. Place plants on the sketch of your flower bed where you feel they would look best. You may wish to do additional resource to see what the plants will look like when they are full-grown.
5. Complete the "Reflection Questions."

Below are special considerations you may want to keep in mind as you work on your project:

- Visualize what your flower bed will look like now and in the future.
- Consult references to find out more about possible plants you might use.
- Seek a balance between the plants you select and the overall cost of the flower bed.
- Take into account the flowering periods of plants. Tulips, for example, bloom in the spring; marigolds bloom from summer to fall. You want your flower bed to look nice throughout the year.

- Consider how much sunlight the plants you select need. Also consider the amount of water necessary.
- Consider whether to choose deciduous or evergreen trees and shrubs. Deciduous plants lose their leaves in the fall; evergreens remain green throughout the year.
- Consider upkeep. Daffodils are perennials, meaning they return each spring. Impatiens are annuals, meaning they do not return each year and will need to be replaced annually. This will require new funds and labor each year for planting.
- Groundcover plants such as rug junipers do precisely what their name implies. They remain low and cover the ground. They are generally hardy and require little upkeep.
- Many plants, especially shrubs and trees, are sold in gallon containers that are related to the size of the plants. A plant in a 3-gallon container is smaller than one in a 5-gallon container.
- Generally the most attractive flower beds are those that have a mixture of flowers, shrubs, and trees with pleasing colors.
- Read through the rubric before you get started so you know how you will be graded.

You will hand in:

1. Final sketch of your flower bed (including scale and plants).
2. Budget Recording Sheet.
3. Reflection Questions.

Name _____

DATA SHEET 6.2

Facts and Prices of Selected Plants

Unless otherwise noted, the plants listed below are perennials. They generally tolerate varying amounts of sunlight and grow well in many different regions of the country. Heights given in the descriptions are adult sizes; heights given with prices are the size at the time of sale.

Trees

Japanese maple—red-leafed deciduous tree, 15 to 20 feet. Full sun to light shade. 4 feet high: \$24.95.

Dogwood—deciduous, white or pink flowers in late spring, 20 to 30 feet. Half sun to light shade. White, 4 feet high: \$19.95; pink, 5 feet high: \$24.95.

American holly—slow-growing evergreen, 45 to 50 feet. Full sun to light shade. 4 feet high: \$29.95.

Canadian hemlock—evergreen, graceful pyramidal shape, 40 to 70 feet. Full sun to light shade. 5 feet high: \$24.95.

Shrubs

Azalea—variety of flower colors. Blooms in spring. Up to 4 feet. 3 gallon, 12 inches high: \$5.95.

Rhododendron—evergreen up to 10 feet. Red, purple, and white are typical flower colors. Spring blooming. 3 gallon, 18 inches high: \$7.95; 5 gallon, 24 inches high: \$12.95.

Dwarf burning bush—deciduous, up to 6 feet. Brilliant red leaves in fall. 3 gallon, 12 inches high: \$9.95.

Forsythia—fast growing. 8 to 10 feet, bright yellow flowers in early spring. 6 feet high: \$9.95.

Common juniper—evergreen. 5 to 10 feet, spiny blue-green leaves. 5 gallon, 12 inches high: \$8.95.

Blue rug juniper—evergreen. Excellent ground cover with blue-green foliage. 3 gallon: \$3.95.

Facts and Prices of Selected Plants (Cont'd.)

Flowers

Daffodils—hardy bulbs. 4 to 18 inches. Variety of colors. Spring blooming. Pack of 20 bulbs: \$4.95.

Tulips—hardy bulbs. 6 to 30 inches. Variety of colors. Spring blooming. Pack of 20 bulbs: \$5.95.

Common petunias—10 to 18 inches. Variety of colors. Bloom from late spring to the first frost. Annuals except in the mildest of areas. \$.89 each.

Geraniums—12 to 24 inches. Variety of colors. Bloom from late spring to the first frost. Annual. \$3.95 each.

Marigolds—6 to 18 inches. Variety of colors. Bloom from summer to first frost. Annual. 6 for \$1.99.

Impatiens—6 to 18 inches. Variety of colors. Bloom from summer to first frost. Excellent for shady areas. Annual. 6 for \$1.79.

Hyacinths—hardy bulbs. 12 to 15 inches. Mostly white, blue, or purple. Spring blooming. Pack of 20 bulbs: \$6.95.

Lilies—hardy bulbs. Up to 36 inches. Variety of colors. Summer to early fall blooming. Pack of 12 bulbs: \$8.95.

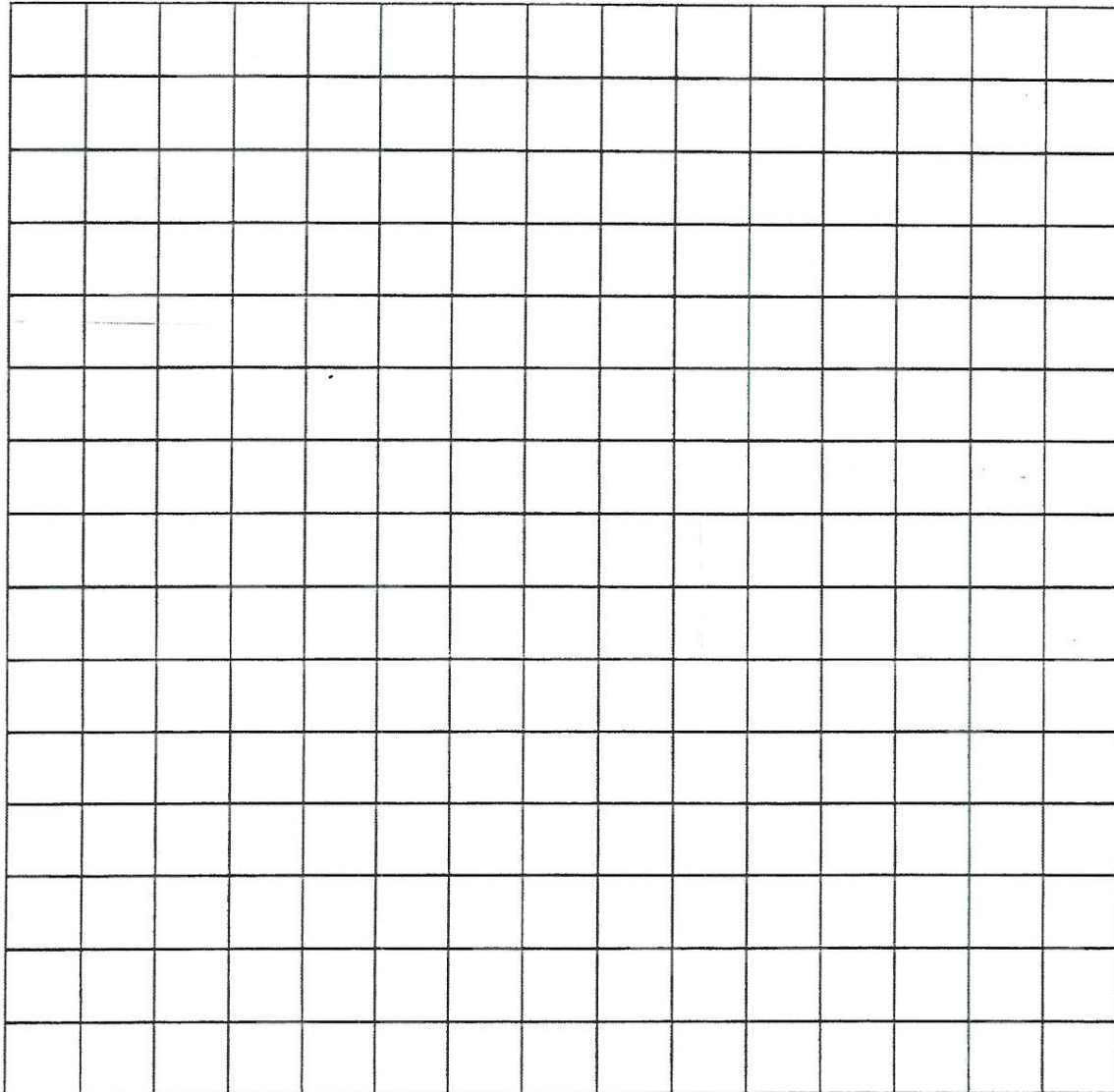
Chrysanthemums—1 to 4 feet. Variety of colors. Late summer and fall blooming. \$4.95 each.

Crocuses—hardy bulbs. 2 to 6 inches. Variety of colors. Late winter blooming. Pack of 20 bulbs: \$7.95.

Mulch is available at a cost of \$3.95 per 2 cubic-foot bag, which will cover 16 square feet at a depth of one and a half inches. Mulch is decorative and helps retain soil moisture.

Name _____

WORKSHEET 6.3
Centimeter Grid



Name _____

Period _____

Budget Recording Sheet

[illegible]

Name _____

Period _____

Budget Recording Sheet (page 2)

[illegible]

Reflection Questions

Directions: Reflect on your project and answer the following questions. Please answer all questions thoroughly and in complete sentences.

1. Why did you design your flower bed the way you did? Explain your reasoning.
2. Find the perimeter of your flower bed. Perimeter is the measurement on the outside of a figure. Explain how you arrived at your answer.
3. Find the area of your flower bed. Area is the amount of space inside a figure. Explain how you arrived at your answer.
4. How did you determine which plants to include in your flower bed? How did you determine where they should be placed?
5. What was your final budget? Explain how you calculated the amount of money you were spending. What operations did you use to determine your budget?
6. Please write about what you have learned from this assignment.

Designing a Flower Bed Rubric

	4	3	2	1
Sketch of flower bed	Sketch includes an appropriate and accurate scale and a variety plants. The design is visually appealing and could be used in real-life. The flower bed is within the boundaries of 30 feet by 40 feet.	Sketch includes a scale and a variety of plants. The scale may not be appropriate for the flower bed. The design is appealing and logical for a flower bed. The flower bed is within the boundaries of 30 feet by 40 feet.	Sketch includes a scale and plants. The scale may not be accurate. There could be a larger variety of plants included. The flower bed is within the boundaries of 30 feet by 40 feet.	Sketch is lacking a scale or plants. Mathematical mistakes are prevalent. The flower bed is not within 30 by 40 feet.
Budget Recording Sheet	Includes a variety of plants, accurate prices, total, and budget remaining. All sections are mathematically accurate. Does not exceed a \$500 budget.	Includes a variety of plants, accurate prices, total, and budget remaining. Very few mathematical mistakes. Does not exceed a \$500 budget.	Includes few plants, accurate prices, total, and budget remaining. May have several mistakes or exceed a \$500 budget.	Sections of the Recording Sheet may be incomplete or inaccurate. Exceeds a \$500 budget.
Reflection Questions	All questions are answered. Explains are detailed and clear. All mathematics is correct.	All questions are answered and easy to understand. Most mathematics is correct.	All questions are answered. Explanations are usually easy to follow but details may be lacking. May have a few mathematical errors.	Most questions are answered. Explanations may be incomplete.
Neatness and Creativity	All work is neat and legible. The flower bed is creative and attractive. Colors and designs are used to enhance the product. The final product shows a lot of time and effort went into the completion of this project.	All work is neat and legible. The flower bed is creative and attractive.	Most of the work is neat. The flower bed is simply sketched with few details.	Work is unorganized or difficult to read. The final product shows little effort.

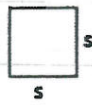
Name _____

Date _____

4-37 Finding Perimeters and Areas of Quadrilaterals

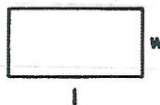
Find the perimeters and areas of these quadrilaterals and write them in the spaces provided. You might find it helpful to sketch and label each figure on a separate sheet of paper. Match your numerical answer with the answer from the answer bank and write the letter of the answer on the blank beneath it. Then write the letters of your answers for each problem in order, starting with the first problem, to complete the statement at the end of the activity. The first problem is done for you.

Use the formulas that follow:



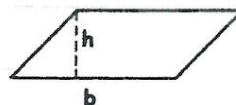
$$A = s^2$$

Square



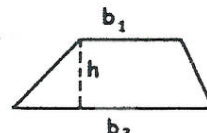
$$A = lw$$

Rectangle



$$A = bh$$

Parallelogram



$$A = \frac{1}{2} h(b_1 + b_2)$$

Trapezoid

1. Rectangle: $l = 10$ in., $w = 4$ in.

$$P = \underline{28} \text{ in.}$$

$$A = \underline{40} \text{ sq. in.}$$

M

A

2. Square: $s = 11.5$ ft.

$$P = \underline{\hspace{1cm}} \text{ ft.}$$

$$A = \underline{\hspace{1cm}} \text{ sq. ft.}$$

\hspace{1cm}

\hspace{1cm}

3. Parallelogram: $b = 9$ cm, $h = 6$ cm, sides = 8.5 cm

$$P = \underline{\hspace{1cm}} \text{ cm}$$

$$A = \underline{\hspace{1cm}} \text{ sq. cm}$$

\hspace{1cm}

\hspace{1cm}

4. Square: $s = 10$ in.

$$P = \underline{\hspace{1cm}} \text{ in.}$$

$$A = \underline{\hspace{1cm}} \text{ sq. in.}$$

\hspace{1cm}

\hspace{1cm}

5. Rectangle: $l = 16$ m, $w = 2.5$ m

$$P = \underline{\hspace{1cm}} \text{ m}$$

$$A = \underline{\hspace{1cm}} \text{ sq. m}$$

\hspace{1cm}

\hspace{1cm}

6. Trapezoid: $b_1 = 21$ m, $b_2 = 15$ m, $h = 4$ m, sides = 5 m

$$P = \underline{\hspace{1cm}} \text{ m}$$

$$A = \underline{\hspace{1cm}} \text{ sq. m}$$

\hspace{1cm}

\hspace{1cm}

7. Rectangle: $l = 8$ ft., $w = 5$ ft.

$$P = \underline{\hspace{1cm}} \text{ ft.}$$

$$A = \underline{\hspace{1cm}} \text{ sq. ft.}$$

\hspace{1cm}

\hspace{1cm}

Name _____

Date _____

4-37 Finding Perimeters and Areas of Quadrilaterals (Continued)

8. Trapezoid: $b_1 = 8$ m, $b_2 = 16$ m, $h = 3$ m, sides = 5 m
 $P =$ _____ m $A =$ _____ sq. m

9. Rectangle: $l = 1$ cm, $w = 26$ cm
 $P =$ _____ cm $A =$ _____ sq. cm

10. Rectangle: $l = 12$ yd., $w = 6$ yd.
 $P =$ _____ yd. $A =$ _____ sq. yd.

11. Parallelogram: $b = 14$ cm, $h = 2$ cm, sides = 6 cm
 $P =$ _____ cm $A =$ _____ sq. cm

12. Rectangle: $l = 11$ ft., $w = 7$ ft.
 $P =$ _____ ft. $A =$ _____ sq. ft.

13. Trapezoid: $b_1 = 6$ m, $b_2 = 14$ m, $h = 6$ m, sides = 10 m and 6 m
 $P =$ _____ m $A =$ _____ sq. m

14. Rectangle: $l = 11.2$ cm, $w = 2.5$ cm
 $P =$ _____ cm $A =$ _____ sq. cm

15. Parallelogram: $b = 12$ m, $h = 4.5$ m, sides = 6 m
 $P =$ _____ m $A =$ _____ sq. m

16. Trapezoid: $b_1 = 6$ m, $b_2 = 14$ m, $h = 6$ m, sides = 8 m
 $P =$ _____ m $A =$ _____ sq. m

Answer Bank

A 40	M 28	S 72	E 36	N 132.25
T 54	H 26	O 35	V 34	I 27.4
P 77	W 37	L 100	R 60	Y 46

Quadrilaterals that have the same area M A _____

Name _____

Date _____

4-40 Finding the Circumference and Area of Circles



Find the circumference and area of each circle. Use the following formulas: $C = \pi d$ and $A = \pi r^2$. Use 3.14 for π .

1. **Swimming pool:** Diameter = 18 ft.
 $C \approx$ _____ ft. $A \approx$ _____ sq. ft.
2. **Pizza pan:** Radius = 6 in.
 $C \approx$ _____ in. $A \approx$ _____ sq. in.
3. **Flower bed:** Diameter = 8 ft.
 $C \approx$ _____ ft. $A \approx$ _____ sq. ft.
4. **Tabletop:** Radius = 2 ft.
 $C \approx$ _____ ft. $A \approx$ _____ sq. ft.
5. **Patio stepping stone:** Radius = 8 in.
 $C \approx$ _____ in. $A \approx$ _____ sq. in.
6. **Goldfish pond:** Diameter = 6 ft.
 $C \approx$ _____ ft. $A \approx$ _____ sq. ft.
7. **Wall clock:** Diameter = 12 in.
 $C \approx$ _____ in. $A \approx$ _____ sq. ft.
8. **Decorative door wreath:** Diameter = 20 in.
 $C \approx$ _____ in. $A \approx$ _____ sq. in.
9. **Dartboard:** Radius = 11 in.
 $C \approx$ _____ in. $A \approx$ _____ sq. in.
10. **Food plate:** Radius = 5 in.
 $C \approx$ _____ in. $A \approx$ _____ sq. in.

Laboratory Chemistry Emergency Plan Days 1 - 5

Day 1:

- **Introduction – “You Will Be a Chemist”**
 - **Skill Building Topic 6 – “Understanding and Interpreting Graphs and Tables”**
-

Blank Graph Paper

Day 2:

- **Skill Building Topic 7 – “Understanding and Balancing an Equation”**

Day 3:

- **Skill Building Topic 8 – “The Mole”**

Reference:

Periodic Table

DAY ONE: YOU WILL BE THE CHEMIST

“You will be the Chemist”

You are now a Senior at Monroe Township High School. Based on your experiences as a student and interest in Science, you have decided to study a Chemical Science in college. Based on information from various colleges, you have to decide which of the following four professions you wish to study:

Chemist

Chemical Engineer

Biochemist

Pharmacist

From Internet articles, you have found that these professions have different starting salaries and that salary increases with higher degree levels.

<u>Profession</u>	<u>Degree Type</u>	<u>Starting Salary</u>
Astronomer*	PhD	\$ 87,534
Biochemist	BS	\$ 40,943
Biochemist	MS	\$ 60,002
Biochemist	PhD	\$ 85,317
Chemist	BS	\$ 42,462
Chemist	MS	\$ 63,482
Chemist	PhD	\$ 90,354
Chemical Engineer	BS	\$ 54,298
Chemical Engineer	MS	\$ 72,675
Chemical Engineer	PhD	\$ 96,970
Orthopedic Surgeon*	MD	\$303,811
Physician (generalist)*	MD	\$146,017
Pharmacist	PharmD	\$ 88,058

Table 1. Starting Salaries for Various Professions (2008)

*Postgraduate professions that can be studied after one of the above BS degrees

You have also found that the best schools for Chemical Sciences vary according to field. The best schools in each field are listed in Table 2. These lists are based on rankings of advanced degree programs and may not necessarily reflect the relative quality of their BS degree programs.

DAY ONE: YOU WILL BE THE CHEMIST

<u>Top Chemistry Schools</u>	<u>Top Chemical Engineering Schools</u>	<u>Top Biochemistry Schools</u>	<u>Top Pharmacy Schools</u>
California Institute of Technology Massachusetts Institute of Tech. Stanford University University of California--Berkeley Harvard Scripps Research Institute University of Illinois--Urbana-Champaign University of Wisconsin--Madison Cornell University Northwestern University Columbia University University of California--Los Angeles University of Chicago University of Texas--Austin Yale University Penn State Univ.-University Park Princeton University University of Michigan--Ann Arbor University of North Carolina University of California--San Diego University of Pennsylvania Purdue University Texas A&M University University of California--Irvine University of Minnesota--Twin Cities	Massachusetts Institute of Tech. University of California--Berkeley University of Minnesota--Twin Cities California Institute of Technology University of Wisconsin--Madison Stanford University (CA) University of Texas--Austin University of Illinois--Urbana-Champaign University of Delaware Princeton University (NJ) University of Michigan--Ann Arbor Univ. of California--Santa Barbara Purdue University Georgia Institute of Technology Carnegie Mellon University Penn State Univ.-University Park Northwestern University Johns Hopkins University University of Washington Cornell University Texas A&M University University of Pennsylvania Univ. of California--Los Angeles Ohio State University University of Florida	University of California--Berkeley Massachusetts Institute of Tech. Harvard University Stanford University Univ. of California--San Francisco Scripps Research Institute University of Wisconsin--Madison California Institute of Technology University of California--San Diego Yale University John's Hopkins University Vanderbilt University University of Texas - Southwestern University of North Carolina University of Washington Boston University University of Delaware	Univ. of California--San Francisco University of North Carolina University of Minnesota University of Texas--Austin Ohio State University University of Kentucky University of Michigan--Ann Arbor University of Washington Purdue University University of Arizona University of Florida University of Illinois--Chicago University of Maryland University of Wisconsin--Madison University of Southern California University of Iowa University of Tennessee University of Utah University of Kansas University of Pittsburgh University at Buffalo--SUNY Virginia Commonwealth University University of Colorado Auburn University

Table 2: Top Chemical Science Schools in the United States

DAY ONE: YOU WILL BE THE CHEMIST

1. Based on Table 1 and what you know about chemical professions, which field will you study? Explain your choice.
2. What degree level will you try to achieve? Explain your answer.
3. At which school would you like to study (the school does not have to be included in Table 2)? Explain your choice.

To work as a Chemical Professional you must master the following skills:

- Understanding and Interpreting Graphs and Tables
- Understanding and Balancing an Equation"
- Mole concept
- Calculating percent composition
- Stoichiometry

These concepts will be covered in the four following assignments and the Putting It All Together assignment that completes this unit. This unit is designed to cover a 10 day period and will be assigned in two parts

DAY ONE: UNDERSTANDING AND INTERPRETING GRAPHS AND TABLES

Skill Building Topic 6

UNDERSTANDING AND INTERPRETING GRAPHS AND TABLES

The ability to interpret graphs and tables is a necessary skill in science but also finds use in everyday life. In articles or textbooks you are likely to find graphs and tables. Understanding the article's message depends heavily on being able to interpret many different types of graphs and tables.

In science, tables are used to provide information. Frequently one quantity in a table depends upon or is related to another. Tables can be as simple as listing the value for a single property of a substance or very complex. You may be asked to look for relationships among a given set of data. Graphing the data can aid interpretation. Graphs give a visual representation of the data that helps to reveal regularities and patterns not easily seen when data is simply listed in a tabular form.

Basic Graphing Rules

1. First decide where the information will be graphed. The horizontal axis (x-axis) is used for the quantity that can be controlled or adjusted. This is called the independent variable. The vertical axis (y-axis) is used for the quantity that responds to the changes in the quantity on the x-axis. This is called the dependent variable.
2. Choose the scale so the graph becomes large enough to fill most of the available space on the paper.
3. Each regularly spaced division on the graph paper should equal some convenient, constant value. In general, each interval should have a value that can be easily divided visually such as 1, 2, 5, or 10, rather than a value such as 3, 6, 7, or 9.
4. An axis does not need to start at zero, particularly if the plotted values cluster in a narrow range not near zero.
5. Label each axis with the quantity and unit being graphed. For example an axis might be labeled "Temperature, °C."
6. Plot each point. If you plot more than one curve on the same graph, use a different color or geometric shape to distinguish each set of data.
7. For an XY graph, draw a smooth line that lies as close as possible to most of the points. Think of this drawing as a line that is averaging your data. Do not draw a line that connects one point to the next one as in a dot-to-dot drawing. If the curve appears to be straight, draw one continuous line with a ruler.
8. Title your graph with an informative title.

Types of Graphs

Graphs are of four basic types: pie charts, bar graphs, line graphs, and XY-plots. The type chosen depends on the characteristics of the data displayed.

DAY ONE: UNDERSTANDING AND INTERPRETING GRAPHS AND TABLES

Pie Charts

Pie charts show the relationship of parts to a whole. The pie chart in Figure 6 displays the distribution of the world's petroleum reserves. This presentation helps the reader to visualize the magnitude of the differences between various parts of the world. Pie charts are not used as frequently as other types.

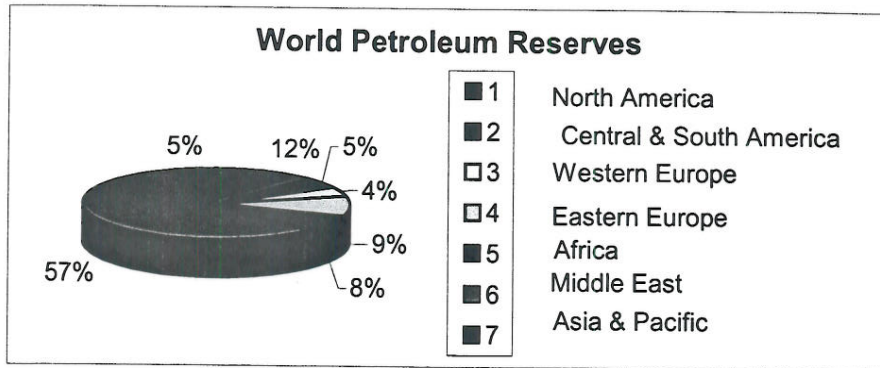


Figure 6: Sample Pie Chart

Bar Graphs

Bar graphs and line graphs compare values in a category or between categories. The bar graph in Figure 7 makes a visual comparison of the fat content of types of cheese. This chart might help the viewer choose a cheese snack with a low fat content.

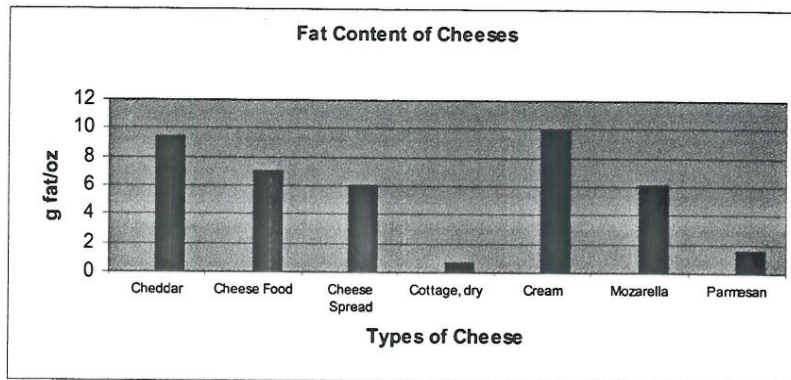


Figure 7: Comparison of Fat Content in Selected Cheeses

Bar graphs also can be useful to study trends over time, as in Figure 8. It quickly shows the reader that generally lower temperatures occur in the early morning hours and higher temperatures occur in the late afternoon. Temperatures also can be predicted for times when a reading was not taken. However, a mathematical relationship between time and temperature is not expected and is not demonstrated. We cannot make any general assumptions for daily temperature graphs that might be constructed at a different location or a different season.

DAY ONE: UNDERSTANDING AND INTERPRETING GRAPHS AND TABLES

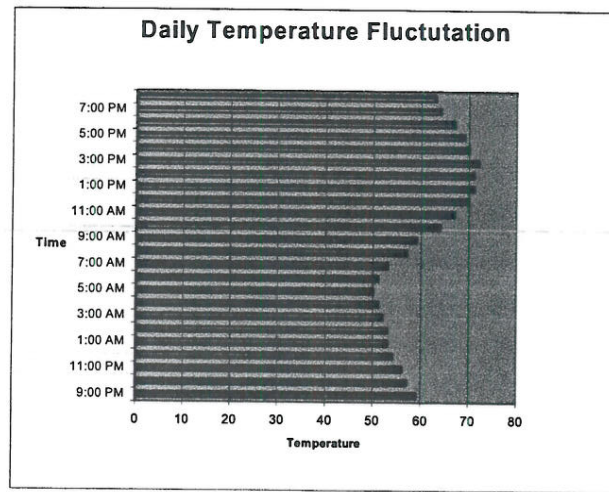


Figure 8: Temperature Fluctuation Graph

Multiple Bar Graphs

Multiple bar graphs compare relationships of closely related data sets. Atomic radii plotted against atomic number (Figure 9) show a pattern, but additional interpretation is possible if the elements are divided into periodic table groups as is shown in Figure 10. Some relationships are more easily seen in this format.

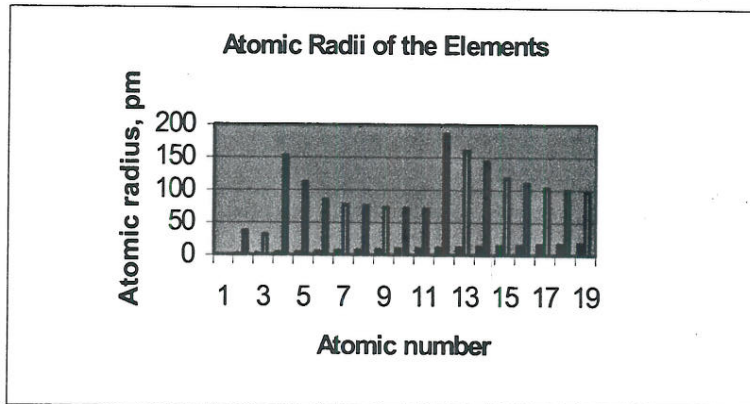


Figure 9: Atomic Radii

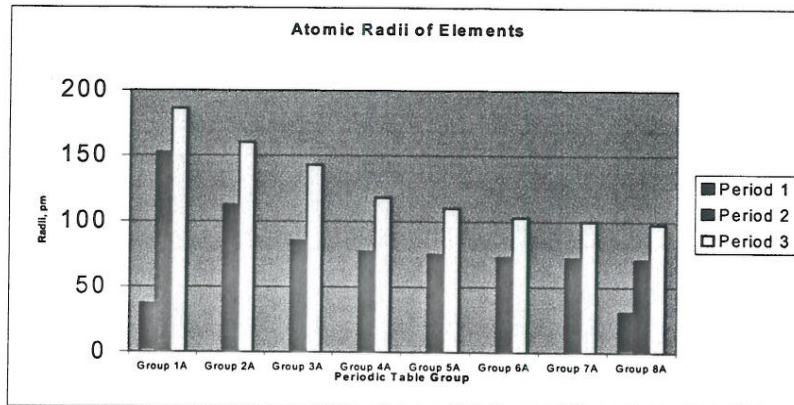


Figure 10: Periodic Table Group Comparison

Line Graphs

DAY ONE: UNDERSTANDING AND INTERPRETING GRAPHS AND TABLES

Constructing a line graph is another way to show the relationship between two variables. The time and temperature data shown in Figure 8 is probably more easily visualized as a line graph (Figure 11). The same type of information is conveyed.

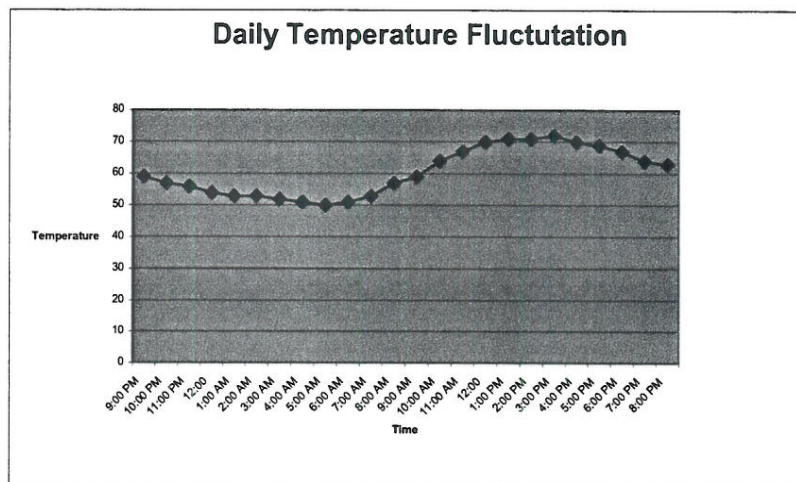


Figure 11: Daily Temperature Fluctuation

XY-Plots

An XY-plot (also called a scatterplot) demonstrates a mathematical relationship between two variables. This type of plot is especially useful in scientific work. Sometimes it is difficult to decide if a graph is a line graph or an XY-plot. One difference is that in an XY-plot it is possible to determine a mathematical relationship between the variables. Sometimes the relationship is the equation for a straight line,

$$y = mx + b$$

but other times it is more complex and requires manipulation of the data. To clarify, we will first look at a straight line, or direct relationship, then proceed to more complex situations.

Example

An entrepreneur was considering investing in a mine that was said to produce gold. Several very small irregular nuggets were given to a chemist for analysis. The chemist, who was instructed to use nondestructive methods, decided to determine the density of the small samples. The chemist used a micro-buret to determine the volume of each nugget, and the mass was determined on an analytical balance. The data collected are shown in Figure 12.

Nugget	Volume(mL)	Mass(g)
1	0.006	0.116
2	0.012	0.251
3	0.015	0.290
4	0.018	0.347
5	0.021	0.386

Figure 12: Gold Nugget Data

Because a mathematical relationship is expected between the mass and volume of an element, the chemist constructed an XY-plot.

DAY ONE: UNDERSTANDING AND INTERPRETING GRAPHS AND TABLES

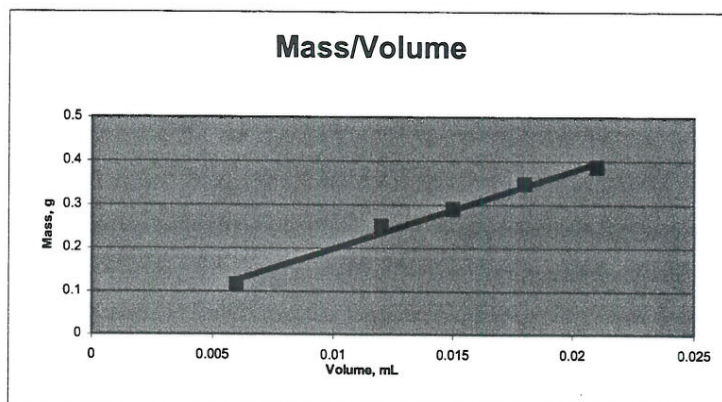


Figure 13: Gold Nugget Graph

To connect the plotted points, the best smooth curve, which appears to be a straight line, is drawn.

Consider a graph where the initial plot is not a straight line. Figure 14 provides the data for the graph in Figure 15. It plots the volume of one mole of NH_3 gas at various pressures.

Pressure (atm)	Volume (mL)
0.1000	244.5
0.2000	122.2
0.4000	61.02
0.8000	30.44
2.000	12.17
4.000	5.975
8.000	2.925

Figure 14: Data for the Effect of Pressure on Volume

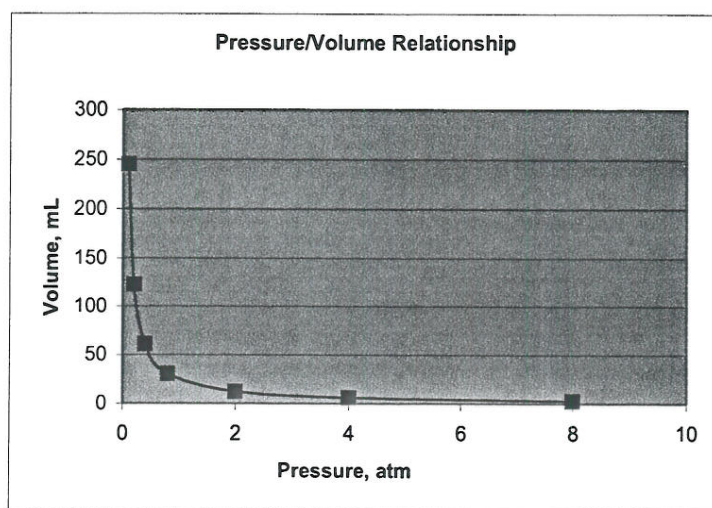


Figure 15: Graph of Pressure-Volume Relationship

DAY ONE: UNDERSTANDING AND INTERPRETING GRAPHS AND TABLES

When the best smooth curve is not a straight line, the data can be manipulated to see if another mathematical relationship is possible. In this case, it appears that, as the pressure increases, the volume decreases. So we can calculate the value of $1/V$, add another column to the table (Figure 16), and plot that data (Figure 17).

Pressure (atm)	Volume (mL)	1/Volume (1/mL)
0.1000	244.5	0.00409
0.2000	122.2	0.00816
0.4000	61.02	0.0164
0.8000	30.44	0.0329
2.000	12.17	0.0822
4.000	5.975	0.167
8.000	2.925	0.3419

Figure 16 Data for Inverse Relationship between Pressure and Volume

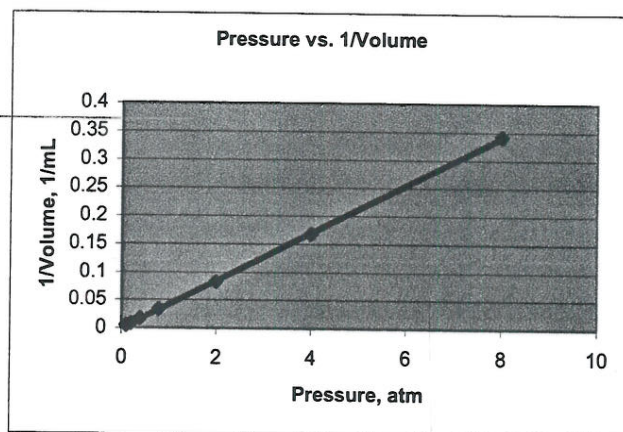


Figure 17: Graph Showing Inverse Relationship Between Pressure and Volume

This time the graph exhibits a straight line so we know that pressure and volume are inversely related. If this mathematical manipulation did not result in a straight line, other mathematical changes or analysis might be considered.

DAY ONE: UNDERSTANDING AND INTERPRETING GRAPHS AND TABLES

Skill Building Topic 6

UNDERSTANDING AND INTERPRETING GRAPHS AND TABLES

Activities

Complete the following activities.

1. The Data Table In Figure 18 Shows The Relationship Between The Month Of The Year And The Average Water Temperatures And Average Dissolved Oxygen Levels In The Snake River At Riverwood.

Month	Water Temperature(°C)	Dissolved Oxygen (ppm)
January	2	12.7
February	3	12.5
March	7	11.0
April	8	10.6
May	9	10.4
June	11	9.8
July	19	9.2
August	20	9.2
September	19	9.2
October	11	10.6
November	7	11.0
December	7	11.0

Figure 18: Snake River Data

- a. Each member of your group will prepare a graph of these data, so you need to make independent decisions about the type of graph you wish to prepare. Be sure to label your axes clearly and to give your graph an informative title. Use only one side of a piece of graph paper.
- b. Compare and discuss each group member's graph. List the advantages and disadvantages of the way each graph presents the information provided in the table.

- c. Select the graph that the group feels conveys the information in the table most successfully. List the factors that the group used in making this choice.

- d. What conclusions about the data can you draw from the graph?

DAY ONE: UNDERSTANDING AND INTERPRETING GRAPHS AND TABLES

2. Answer the following questions based on the graphs in Figures 9 and 10.
- a. How does the atomic radius of an element change within a group as the atomic number increases? Is this generalization consistent for all groups illustrated?
- _____
- _____
- _____
- b. How does the atomic radius of an element change within a period as atomic number increases? Is this generalization true for all groups illustrated?
- _____
- _____
- _____
3. Alkanes are compounds of carbon and hydrogen with the general formula, C_nH_{2n+2} . Suppose that you did an experiment to determine the heat of combustion of several alkanes and noticed that the heat of combustion/mole increased as the number of carbons in the alkane increased. The data taken are shown in Figure 19. In your group, plot a graph to help interpret the data.

Alkane	Number of Carbon Atoms	Heat of Combustion (kJ/mol)
Methane, CH_4	1	891
Ethane, C_2H_6	2	1561
Propane, C_3H_8	3	2219
n-Butane, C_4H_{10}	4	2879
n-Pentane, C_5H_{12}	5	3509

Figure 19: Increase in Heat of Combustion in Alkanes

Answer the following questions using your graph.

- a. Describe the type of relationship that the graph depicts between carbon atoms and the heat of combustion.
- _____
- _____
- _____
- b. Predict the heat of combustion for the alkane with six carbon atoms.
- _____
- _____
- c. Predict the heat of combustion for a substance with no carbon atoms. Why is the value not 0? (Hint: Consider what remains in the formula when there are no carbon atoms.)
- _____
- _____
- d. Could you use this same graph to predict the heat of combustion for other kinds of hydrocarbons (with different carbon to hydrogen combinations)? Why or why not?
- _____
- _____

DAY ONE: UNDERSTANDING AND INTERPRETING GRAPHS AND TABLES

4. The graph in Figure 20 shows the approximate level of CO_2 in the atmosphere from 1900 to 1990 for available decades. Study the graph and answer these questions:
- a. Predict the CO_2 Levels in 1910, 1940, and 2000.

- b. What other type(s) of graph might also be useful to study this data?

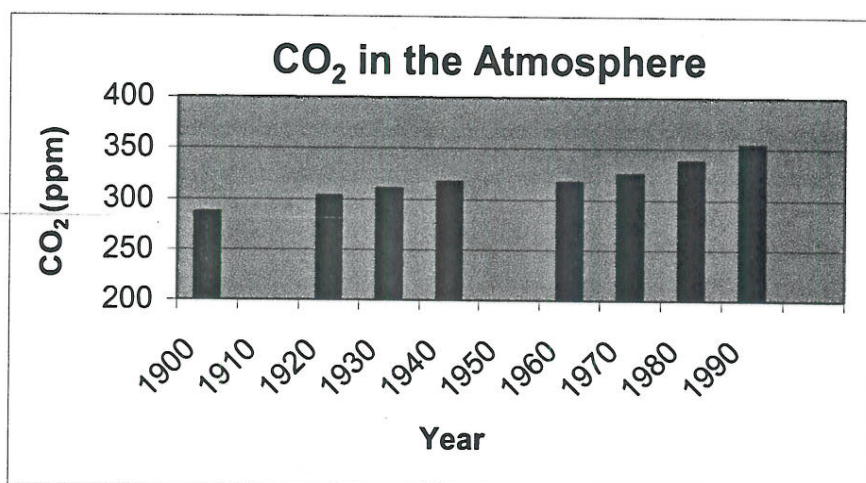


Figure 20: Relative CO_2 Levels

5. Graphically determine the density of ethylene glycol for the following data collected in the laboratory.

Volume (mL)	Mass (g)
10.0	11.20
15.0	16.72
20.0	22.14
25.0	27.78
30.0	33.42

Figure 21: Ethylene Glycol Density Data

DAY ONE: UNDERSTANDING AND INTERPRETING GRAPHS AND TABLES

6. The data below was collected when water was heated to its boiling point. Make a plot of this data. Answer the questions.

Time (sec)	Temperature (°C)
0.0	23.0
0.5	27.0
1.0	34.0
1.5	43.0
2.0	58.0
2.5	69.0
3.0	75.0
3.5	83.0
4.0	90.0
4.5	94.0
5.0	96.0
5.5	97.0
6.0	98.0
6.5	99.0
7.0	100.0
7.5	100.5

Figure 22: Boiling Water Data

- a. What type of graph did you choose to plot? Explain why you chose this type.

- b. Describe the change in temperature with time.

- c. Predict the temperature at 4.3 minutes.

- d. Predict the temperature at 8.5 minutes.

- e. During what time period was there the greatest change in temperature?

DAY ONE: UNDERSTANDING AND INTERPRETING GRAPHS AND TABLES

7. Use the table below to answer the following questions.

Substance	Formula	Melting Point(°C)	Molar Mass	Structure	Polarity of Molecule
Water	H ₂ O	0	18	Molecular	Polar—H bonds
Benzene	C ₆ H ₆	5	78	Molecular	Nonpolar
Naphthalene	C ₁₀ H ₈	80	128	Molecular	Nonpolar
Sodium chloride	NaCl	800	58.5	Ionic	Not Applicable
Methane	CH ₄	2183	16	Molecular	Nonpolar
Magnesium fluoride	MgF ₂	1248	62	Ionic	Not Applicable
Methanol	CH ₃ OH	297.8	32	Molecular	Polar—H bonds

Figure 23: Complex Table Showing Selected Properties of Substances

- a. Find two compounds in the table with similar molar masses. Compare their melting points. Which of the characteristics listed appears to correlate with the differences in melting point?

- b. Compare the molecular compounds with the ionic compounds and make a generalization about structure and melting point.

- c. Compare the characteristics of methane, benzene, and naphthalene. What factor seems to be responsible for differences in melting point?

- d. The previous three questions use only some of the information available in the table. Write two more questions that might be asked about the table.

DAY ONE: UNDERSTANDING AND INTERPRETING GRAPHS AND TABLES

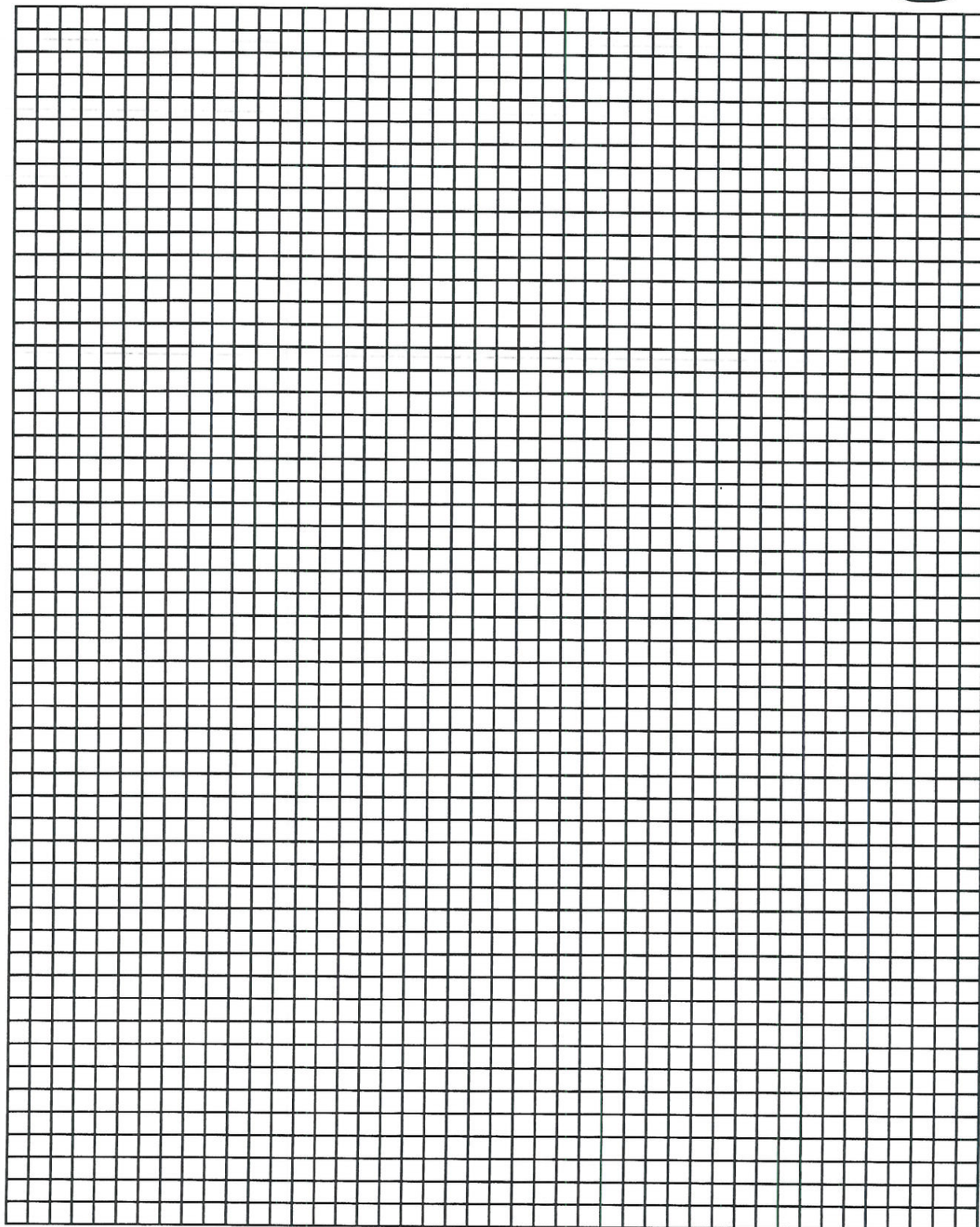
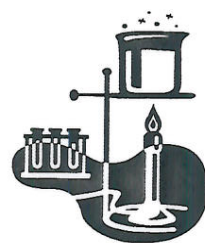
- e. It is important to use all of the information available in a table. However, you should not make sweeping generalizations that are supported by only a small number of facts. Look at your answer to Question 1 and state what other information you might wish to look up to support your statement.

MTHS

Teacher Name

Class/Project

Date



DAY TWO: UNDERSTANDING AND BALANCING EQUATIONS

Skill Building Topic 7

UNDERSTANDING AND BALANCING EQUATIONS

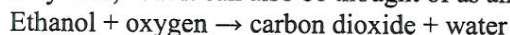
Equations are the language of chemistry, and they are important in helping us understand how atoms and molecules form new substances. It has been said many times that chemistry is a quantitative science. Chemistry is also a very precise science. Atoms combine to form molecules in definite ratios. Substances react in definite ratios to form new materials. Atoms and molecules are very small and difficult to count individually, so the idea of a mole was developed.

Understanding Chemical Equations

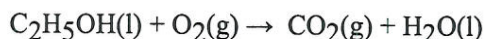
One way to describe a chemical reaction can be described by writing an English sentence.

When ethanol burns in the presence of sufficient oxygen, the products are carbon dioxide and water.

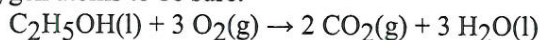
Another way is to write a word equation using the chemical names of the reactants and products. The arrow here is often read "yields," but it can also be thought of as an equal sign.



While a word equation does provide us with additional information, replacing the chemical names with formulas and indicating the physical states of each substance is even more descriptive and specific.



However, a chemical sentence is not an equation until it is balanced. The **law of conservation of matter** states that *in a chemical reaction, matter is neither created nor destroyed*. That means the number of atoms of each type must be the same on both sides of the equation. The following chemical equation shows a balanced chemical equation. Count the number of carbon atoms, hydrogen atoms, and oxygen atoms to be sure.

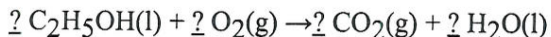


Reactant Side	→	Product Side
2 carbon atoms		2 carbon atoms
6 hydrogen atoms		6 hydrogen atoms
7 oxygen atoms		7 oxygen atoms

Balancing Chemical Equations

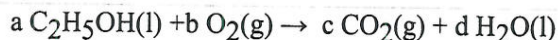
In Unit 2 of your textbook, you were given instructions for balancing equations. You balanced equations by inspecting the number of each type of atom on each side of the equation. You changed coefficients in order to obtain the same number of atoms of each element on the reactant side as on the product side. For some equations, this process may be tedious. Presented below is an alternative method for balancing equations. This method uses the law of conservation of matter and simple algebra.

Let's take another look at an unbalanced chemical sentence:



DAY TWO: UNDERSTANDING AND BALANCING EQUATIONS

We know that when this equation is balanced it will have specific values for the coefficient of each reactant and product. We do not know the value of these. For each unknown we can assign a variable:



We can now write an algebraic expression for each element in this reaction. When the equation is balanced, the number of carbon atoms on the reactant side must be equal to the number of carbon atoms on the product side (law of conservation of matter).

On the reactant side there are $2a$ carbon atoms (we multiply the coefficient by the subscript).
On the product side there are $1c$, or c , carbon atoms, so we can say:

$$\text{Carbon atoms: } 2a = c$$

Repeating this process for each element in the reaction we obtain the following:

$$\text{Hydrogen atoms: } 6a = 2d$$

$$\text{Oxygen atoms: } a + 2b = 2c + d$$

At this point, we assign one of the variables the value of 1 and solve for the remaining variables. Generally, it is best to assign the value of 1 to the variable for the most complicated compound. Since a is assigned to $\text{C}_2\text{H}_5\text{OH}$, choose $a = 1$.

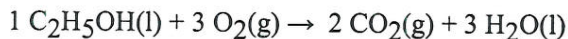
$$\text{So if } a = 1, \text{ then } 2(1) = c \text{ and } c = 2.$$

$$\text{And } 6(1) = 2d, \text{ so } d = 3$$

$$\text{Finally } 1 + 2b = 2(2) + 3,$$

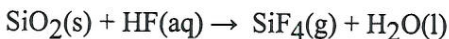
$$\text{so when you solve for } b, b = 3$$

Substitute the numerical values into the chemical equation and count atoms to ensure that the equation is balanced.

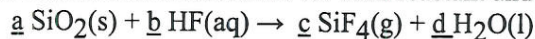


Example 1

Balance the following equation:



Step 1: Assign variables for coefficients for each reactant and product:



Step 2: Write algebraic equations for the number of each element on each side of the equation:

$$\text{Silicon atoms: } a = c$$

$$\text{Oxygen atoms: } 2a = d$$

$$\text{Hydrogen atoms: } b = 2d$$

$$\text{Fluorine atoms: } b = 4c$$

Step 3: Assign one of the variables the value of 1:

$$a = 1$$

DAY TWO: UNDERSTANDING AND BALANCING EQUATIONS

Step 4: Solve for the other variables using the assignment made in Step 3.

If $a = 1$, then $c = 1$,
and $d = 2$,
and $b = 4$.

Step 5: Substitute these values into the equation and check:



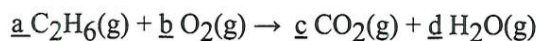
(NOTE: The coefficient that has a value of 1 is understood and is generally not written. It was written in the previous examples only for emphasis.)

Example 2

Balance the following equation:



Step 1:



Step 2:

Carbon atoms: $2a = c$

Hydrogen atoms: $6a = 2d$

Oxygen atoms: $2b = 2c + d$

Step 3:

$$a = 1$$

Step 4:

If $a = 1$, then $c = 2$,

$d = 3$,

$b = 7/2$.

Occasionally we obtain a fraction as a solution. If this occurs, we multiply all the variables by a common factor to eliminate fractions.

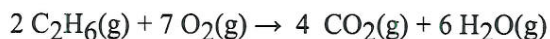
$$a = 1 \times 2 = 2$$

$$c = 2 \times 2 = 4$$

$$d = 3 \times 2 = 6$$

$$b = 7/2 \times 2 = 7$$

Step 5:



DAY TWO: UNDERSTANDING AND BALANCING EQUATIONS

Skill Building Topic 7

UNDERSTANDING AND BALANCING EQUATIONS

Practice Exercises

Balance the following equations.

1. $\text{Zn} + \text{HCl} \rightarrow \text{ZnCl}_2 + \text{H}_2$
2. $\text{Al} + \text{O}_2 \rightarrow \text{Al}_2\text{O}_3$
3. $\text{C}_4\text{H}_{10} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
4. $\text{KClO}_3 \rightarrow \text{KCl} + \text{O}_2$
5. $\text{Fe} + \text{H}_2\text{O} \rightarrow \text{Fe}_3\text{O}_4 + \text{H}_2$
6. $\text{CaC}_2 + \text{H}_2\text{O} \rightarrow \text{C}_2\text{H}_2 + \text{Ca(OH)}_2$
7. $\text{MnO}_2 + \text{HCl} \rightarrow \text{MnCl}_2 + \text{H}_2\text{O} + \text{Cl}_2$
8. $\text{Fe}_2\text{O}_3 + \text{CO} \rightarrow \text{Fe} + \text{CO}_2$
9. $\text{H}_2\text{O}_2 \rightarrow \text{H}_2\text{O} + \text{O}_2$
10. $\text{C}_2\text{H}_5\text{OH} + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
11. Write balanced chemical equations for the reactions that occur in each of the following situations.
 - a. When benzene (C_6H_6) combines with the oxygen (O_2), the products are carbon dioxide (CO_2) and water (H_2O).

DAY TWO: UNDERSTANDING AND BALANCING EQUATIONS

- b. When photosynthesis takes place in a green plant, carbon dioxide and water combine to produce glucose ($C_6H_{12}O_6$) and oxygen.
-
- c. Nitroglycerin ($C_3H_5N_3O_9$), a drug used for heart pain problems, is synthesized from glycerin ($C_3H_8O_3$) and nitric acid (HNO_3) in the presence of a catalyst. Water is also a product of the reaction.
- d. Some antacids contain aluminum hydroxide [$Al(OH)_3$], which reacts with the acid (HCl) in the stomach to produce aluminum chloride ($AlCl_3$) and water.
- e. An antacid remedy contains sodium bicarbonate ($NaHCO_3$) and citric acid ($H_3C_6H_5O_7$), which react to produce carbon dioxide (the source of the familiar fizz), sodium citrate ($Na_3C_6H_5O_7$), and water.
- f. When table sugar ($C_{12}H_{22}O_{11}$) is heated, water vapor and elemental carbon form.

DAY THREE: THE MOLE

Skill Building Topic 8 THE MOLE

What Is A Mole?

The term mole is classified as a counting number, a number used to specify a certain number of objects. Pair and dozen are other examples of counting numbers. Seldom does anyone purchase computer paper by the sheet. Instead you buy a ream, or package of 500 sheets. At the grocery store you buy eggs by the dozen. Many other objects are identified in packages of this size—rolls, ears of corn, file folders. When you buy a package of a dozen, you know you will get twelve objects. A mole equals 6.02×10^{23} objects! Most often, objects that are counted in units of moles are very small—atoms, molecules, or electrons. Because it would take an impossibly long time to count 6.02×10^{23} objects, an indirect method is used. An analogy may be helpful. Sometimes people save money by tossing all coins of a certain value into a large container. When the container is full they take it to the bank. Instead of counting each coin, the bank employee finds the mass of all of the coins and divides the result by the mass of one coin. (How long do you think it would take to count a mole of dimes?)

Moles And Molar Mass

The modern definition of a mole is the number of atoms in exactly 12 grams of the carbon-12 ($C-12$) isotope. This number itself is named after Amedeo Avogadro, who investigated related concepts but never determined the number. At least four different types of experiments have determined that the number is 6.02×10^{23} . Avogadro's number is known to ten significant figures, but three will be enough for most of your calculations.

$$1 \text{ mole} = 6.022126736 \times 10^{23} \text{ particles}$$

The modern atomic-weight scale is also based on $C-12$. The relative mass of a hydrogen atom compared to a carbon atom is 1.008. Therefore, one mole of hydrogen atoms has a mass of 1.008 g, and one mole of oxygen atoms is 15.9994 g. The number of grams in one mole, or molar mass, of a compound is found by adding the relative atomic masses of the atoms in the formula.

Example:

Determine the molar mass of water, H_2O .

$$2 \text{ moles H} \times \frac{1.00 \text{ grams H}}{1.00 \text{ mole H}} = 2.0 \text{ grams H}$$

$$1 \text{ mole O} \times \frac{16.0 \text{ grams O}}{1.00 \text{ mole O}} = 16.0 \text{ grams O}$$

$$\text{Molar Mass of Water} = 18.0 \text{ grams}$$

Mass-Mole Conversions

Conversions between masses and moles can best be accomplished by using dimensional analysis.

Example

What mass (in grams) of water contains 0.25 mol H_2O ?

The mass of one mole of water (18.0 g) is found as shown above. The two common factors are:

$$\frac{1 \text{ mol } H_2O}{18.02 \text{ g } H_2O} \text{ and } \frac{18.02 \text{ g } H_2O}{1 \text{ mol } H_2O}$$

DAY THREE: THE MOLE

Of the two choices shown above, the second conversion factor is chosen in order to cancel the labels. Units for the answer are g H₂O, as expected.

$$0.25 \text{ mol H}_2\text{O} \times \frac{18.02 \text{ g H}_2\text{O}}{1 \text{ mol H}_2\text{O}} = 4.5 \text{ g H}_2\text{O}$$

Example:

How many moles of water are present in 1.00-kg sample of water?

$$1.000 \text{ kg} \times \frac{1000 \text{ g}}{1 \text{ kg}} \times \frac{1 \text{ mol H}_2\text{O}}{18.02 \text{ g H}_2\text{O}} = 55.49 \text{ mol}$$

DAY THREE: THE MOLE

Skill Building Topic 8

THE MOLE

Practice Exercises

Find the molar mass (grams in one mole) of each of the following:

1. Acetic acid, CH_3COOH
2. Formaldehyde, HCHO
3. 2-Dodeconol, $\text{CH}_3(\text{CH}_2)_9\text{CH}(\text{OH})\text{CH}_3$
4. Glucose, $\text{C}_6\text{H}_{12}\text{O}_6$
5. Ethanol, $\text{C}_2\text{H}_5\text{OH}$
6. Phosphoric acid, H_3PO_4
7. Cobalt(II) chloride hexahydrate, $\text{CoCl}_2 \cdot 6 \text{H}_2\text{O}$

Convert between grams and moles as indicated.

8. Acetic acid, CH_3COOH , and salicylic acid, $\text{C}_7\text{H}_6\text{O}_3$, combine to form aspirin. If a chemist uses 5.00 g salicylic acid and 10.53 g acetic acid, calculate the number of moles of each compound used.

DAY THREE: THE MOLE

9. Dodecanol, $\text{CH}_3(\text{CH}_2)_9\text{CH}(\text{OH})\text{CH}_3$ is used in synthesis of wetting agents. A manufacturer orders 500.0 kg of the compound. How many moles are ordered?
10. Calcium chloride hexahydrate, $\text{CaCl}_2 \cdot 6 \text{H}_2\text{O}$, is sprinkled on sidewalks to melt ice and snow. How many moles of the compound are in a 5.0 kg sack of the material?
11. A certain amount (1.5 mol) of sodium hydroxide, NaOH , is required to prepare a solution. What is the equivalent number of grams?
12. The laboratory technician must prepare a solution that requires 0.123 mol silver nitrate, AgNO_3 . How many grams are necessary?

<div> <div>1 1A</div> <div>1 H Hydrogen 1.01</div> <div>2 2A</div> <div>3 3A</div> <div>4 4A</div> <div>5 5A</div> <div>6 6A</div> <div>7 7A</div> <div>8 8A</div> </div>																	
<div> <div>2 3 Li Lithium 6.94</div> <div>4 4 Be Beryllium 9.01</div> <div>5 5 B Boron 10.81</div> <div>6 6 C Carbon 12.01</div> <div>7 7 N Nitrogen 14.01</div> <div>8 8 O Oxygen 16.00</div> <div>9 9 F Fluorine 19.00</div> <div>10 10 Ne Neon 20.18</div> </div>																	
<div> <div>11 11 Na Sodium 22.99</div> <div>12 12 Mg Magnesium 24.31</div> <div>13 13 Al Aluminum 26.98</div> <div>14 14 Si Silicon 28.09</div> <div>15 15 P Phosphorus 30.97</div> <div>16 16 S Sulfur 32.07</div> <div>17 17 Cl Chlorine 35.45</div> <div>18 18 Ar Argon 39.95</div> </div>																	
<div> <div>19 19 K Potassium 39.10</div> <div>20 20 Ca Calcium 40.08</div> <div>21 21 Sc Scandium 44.96</div> <div>22 22 Ti Titanium 47.87</div> <div>23 23 V Vanadium 50.94</div> <div>24 24 Cr Chromium 52.00</div> <div>25 25 Mn Manganese 54.94</div> <div>26 26 Fe Iron 55.85</div> <div>27 27 Co Cobalt 58.93</div> <div>28 28 Ni Nickel 58.69</div> <div>29 29 Cu Copper 63.55</div> <div>30 30 Zn Zinc 65.39</div> <div>31 31 Ga Gallium 69.72</div> <div>32 32 Ge Germanium 72.61</div> <div>33 33 As Arsenic 74.92</div> <div>34 34 Se Selenium 78.96</div> <div>35 35 Br Bromine 79.90</div> <div>36 36 Kr Krypton 83.80</div> </div>																	
<div> <div>37 37 Rb Rubidium 85.47</div> <div>38 38 Sr Strontium 87.62</div> <div>39 39 Y Yttrium 88.91</div> <div>40 40 Zr Zirconium 91.22</div> <div>41 41 Nb Niobium 92.91</div> <div>42 42 Mo Molybdenum 95.94</div> <div>43 43 Tc Technetium (98)</div> <div>44 44 Ru Ruthenium 101.07</div> <div>45 45 Rh Rhodium 102.91</div> <div>46 46 Pd Palladium 106.42</div> <div>47 47 Ag Silver 107.87</div> <div>48 48 Cd Cadmium 112.41</div> <div>49 49 In Indium 114.82</div> <div>50 50 Sn Tin 118.71</div> <div>51 51 Sb Antimony 121.76</div> <div>52 52 Te Tellurium 127.60</div> <div>53 53 I Iodine 126.90</div> <div>54 54 Xe Xenon 131.29</div> </div>																	
<div> <div>55 55 Cs Cesium 132.91</div> <div>56 56 Ba Barium 137.33</div> <div>57 57 La Lanthanum 138.91</div> <div>72 72 Hf Hafnium 178.49</div> <div>73 73 Ta Tantalum 180.95</div> <div>74 74 W Tungsten 183.84</div> <div>75 75 Re Rhenium 186.21</div> <div>76 76 Os Osmium 190.23</div> <div>77 77 Ir Iridium 192.22</div> <div>78 78 Pt Platinum 195.08</div> <div>79 79 Au Gold 196.97</div> <div>80 80 Hg Mercury 200.59</div> <div>81 81 Tl Thallium 204.38</div> <div>82 82 Pb Lead 207.2</div> <div>83 83 Bi Bismuth 208.98</div> <div>84 84 Po Polonium (209)</div> <div>85 85 At Astatine (210)</div> <div>86 86 Rn Radon (222)</div> </div>																	
<div> <div>87 87 Fr Francium (223)</div> <div>88 88 Ra Radium (226)</div> <div>89 89 Ac Actinium (227)</div> <div>104 104 Rf Rutherfordium (261)</div> <div>105 105 Db Dubnium (262)</div> <div>106 106 Sg Seaborgium (266)</div> <div>107 107 Bh Bohrium (264)</div> <div>108 108 Hs Hassium (269)</div> <div>109 109 Mt Meitnerium (268)</div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> <div></div> </div>																	

11

Na

Sodium

22.99

Atomic number

Element symbol

Element name

Average atomic mass*

58
Ce
Cerium
140.12

59
Pr
Praseodymium
140.91

60
Nd
Neodymium
144.24

61
Pm
Promethium
(145)

62
Sm
Samarium
150.36

63
Eu
Europium
151.96

64
Gd
Gadolinium
157.25

65
Tb
Terbium
158.93

66
Dy
Dysprosium
162.50

67
Ho
Holmium
164.93

68
Er
Erbium
167.26

69
Tm
Thulium
168.93

70
Yb
Ytterbium
173.04

71
Lu
Lutetium
174.97

90
Th
Thorium
232.04

91
Pa
Protactinium
231.04

92
U
Uranium
238.03

93
Np
Neptunium
(237)

94
Pu
Plutonium
(244)

95
Am
Americium
(243)

96
Cm
Curium
(247)

97
Bk
Berkelium
(247)

98
Cf
Californium
(251)

99
Es
Einsteinium
(252)

100
Fm
Fermium
(257)

101
Md
Mendelevium
(258)

102
No
Nobelium
(259)

103
Lr
Lawrencium
(262)

* If this number is in parentheses, then it refers to the atomic mass of the most stable isotope.

Formulas**Ideal Gas Law:** $PV = nRT$ **Combined Gas Law:** $\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$ **Pressure Formula:** $P = \frac{F}{A}$ **Mass-Energy Formula:** $E = mc^2$ **Calorimetric Formulas –****No Phase Change:** $Q = m(\Delta T)C_p$ **Latent Heat of Fusion:** $Q = m\Delta H_{\text{fus}}$ **Latent Heat of Vaporization:** $Q = m\Delta H_{\text{vap}}$ **Constants****Volume of Ideal Gas at STP:** $22.4 \frac{\text{L}}{\text{mol}}$ **Speed of Light in a Vacuum:** $c = 3.00 \times 10^8 \frac{\text{m}}{\text{s}}$ **Specific Heat of Water:** $C_p(\text{H}_2\text{O}) = 1.00 \frac{\text{cal}}{(\text{g } ^\circ\text{C})} = 4.18 \frac{\text{J}}{(\text{g } ^\circ\text{C})}$ **Latent Heat of Fusion of Water:** $\Delta H_{\text{fus}}(\text{H}_2\text{O}) = 80 \frac{\text{cal}}{\text{g}} = 334 \frac{\text{J}}{\text{g}}$ **Latent Heat of Vaporization of Water:** $\Delta H_{\text{vap}}(\text{H}_2\text{O}) = 540 \frac{\text{cal}}{\text{g}} = 2260 \frac{\text{J}}{\text{g}}$ **Unit Conversions****Calorie-Joule Conversion:** $1 \text{ cal} = 4.184 \text{ J}$ **Absolute Temperature Conversion:** $\text{K} = ^\circ\text{C} + 273$ **Pressure Conversions:** $1 \text{ atm} = 760 \text{ mm Hg} = 760 \text{ Torr} = 101.325 \text{ kPa} = 14.7 \frac{\text{lbs.}}{\text{in.}^2} = 29.92 \text{ in. Hg}$