Portland Public Schools
Middle Level

2016-2017

Teacher: Full Name Katrina Arras		**School:** Mt. Tabor Middle School
Subject: Science	**Course Title:** 7th – Integrated Science	**Grade Level(s)**: 7

Is high school credit an option for this course?

- ☐ Yes
- X No

Prerequisites: 6th grade life science

Course description: This year, students will study integrated science in accordance with our new state standards, which means that we will study a unit from each discipline of science (earth, physical, and life). The common theme that will connect our different science discipline is the Pacific Northwest, and the crosscutting concepts of energy and matter, and cause and effect. Our year-long questions are:

How do energy and matter flow in the Pacific Northwest? (Energy & Matter)
How do organisms and Earth processes affect one another in the Pacific Northwest? (Cause & Effect)

This year we will study chemistry in the fall, ecology in the winter, and plate tectonics, as well as erosion and deposition in the spring. During each of our units, we will have unit questions that connect our content back to the theme of the Pacific Northwest.

The curriculum we use is called SEPUP. Below you will find an excerpt of a letter written by the publisher of our curriculum that explains the course quite well.

Dear Parent or Guardian,

This year, your child is using a science course called Issues and Physical Science (IAPS) that was developed by SEPUP, the Science Education for Public Understanding Program. SEPUP has developed and published innovative and highly acclaimed middle school curriculum for more than 30 years. Is- sues and Physical Science, like other SEPUP curriculum materials, was funded by the National Science Foundation. To learn more about SEPUP, visit us on the Internet at www.sepuplhs.org.

Issues and Physical Science is an engaging hands-on physical science course based on the educational approach of scientific inquiry. As such, it uses several kinds of activities to teach science. For example, students design and conduct an experiment to investigate the effects of speed and mass on vehicle

collisions, explore molecular models of water and other chemicals, play the roles of scientists investigating water quality, and read about alternative energy sources. A combination of experiments, readings, models, debates, role-plays, and projects help students discover the nature of science, learn science content, and experience the relevance of science in today's world.

How do we know that this is a good way for your child to learn? In general, research on science education supports it. In particular, SEPUP tests out its materials, such as Issues and Physical Science, with hundreds of students and their teachers throughout the country, and experts in the life sciences provide scientific review of the content. SEPUP then revises the materials based on the feedback and evaluation of the materials. We believe the resulting curriculum shows students that learning and using scientific ideas is an important and an exciting endeavor.

Sincerely, The SEPUP Staff Lawrence Hall of Science University of California, Berkeley

Priority Standards:

NEXT GENERATION SCIENCE STANDARDS

In the spring of 2014, Oregon adopted the Next Generation Science Standards (NGSS) as the science standards for Oregon. We are in the process of implementing the new standards. In addition to content standards, the NGSS require students to be taught Science and Engineering Practices and Crosscutting Concepts. To learn more about the NGSS, please go to: http://www.nextgenscience.org/three-dimensions. Below, please find a brief description of these two additional dimensions:

Crosscutting Concepts:

"Crosscutting concepts have application across all domains of science. As such, they are a way of linking the different domains of science." (NGSS website – link above) They include:

1. Patterns
2. Cause and effect
3. Scale, proportion and quantity
4. Systems and system models
5. Energy and matter: flows, cycles and conservation
6. Structure and function
7. Stability and change

Science and Engineering Practices:

"The practices describe behaviors that scientists engage in as they investigate and build models and theories about the natural world and the key set of engineering practices that engineers use as they design and build models and systems." (NGSS website – link above)
These practices are:

1. Asking questions & defining problems
2. Developing & using models
3. Planning & carrying out investigations
4. Analyzing & interpreting data
5. Using mathematics & computational thinking
6. Constructing explanations & designing solutions
7. Engaging in argument from evidence
8. Obtaining, evaluating & communicating information

IMPLEMENTATION OF NGSS

We will learn and be assessed on content and practices this year in school. The content and practices will be assessed in tests, quizzes, and analysis questions.

The crosscutting concepts will be assessed through our portfolio, where we collect information to answer our unit questions.

CONTENT

The new NGSS standards will be taught and assessed this year.

EARTH

MS-ESS2-1: Develop of model to describe the cycling of Earth's materials and the flow of energy that drives this process.
MS-ESS2-2: Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
MS-ESS2-3: Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of past plate motions.
MS-ESS3-1: Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
MS-ESS3-2: Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

LIFE

MS-LS1-6: Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
MS-LS1-7: Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism.
MS-LS2-1: Analyze and interpret data to provide evidence for the effects of resource

availability on organisms and populations of organisms in an ecosystem.
MS-LS2-2: Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
MS-LS2-3: Develop a model to describe the cycling of matter and flow of energy among living and non-living parts of an ecosystem.
MS-LS2-4: Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
MS-LS2-5: Evaluate competing design solutions for maintaining biodiversity and ecosystem services.

PHYSICAL
MS-PS1-1: Develop models to describe the atomic composition of simple molecules and extended structures.
MS-PS1-2: Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.
MS-PS1-3: Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.
MS-PS1-4: Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.
MS-PS1-5: Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.
MS-PS1-6: Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.

Schedule of topics/units covered:

7th graders will study integrated science. Below you will find the name of the units we will complete as well as a few of the topics we will learn about in each unit.

- Studying Materials Scientifically: lab safety, handling hazardous materials, properties of substances, density, identifying unknown substances.
- The Chemistry of Materials: physical and chemical properties, elements and compounds, the Period Table, chemical reactions, conservation of mass.
- Ecology: introduced species, competition, predation, relationships within an ecosystem
- Erosion & Deposition: topography, erosion, deposition, landforms
- Plate Tectonics: Earth's history, earthquakes, volcanoes, plate tectonics, Earth's structure

Academic Vocabulary: Students will be exposed to a lot of academic vocabulary in this class. Vocabulary will be introduced through activities and experiences, and then formally defined together. I will help students define vocabulary in their notebooks, and it will be highlighted in yellow. Additionally, we will practice learning how to study that vocabulary. (See website for document on how to study.)

District adopted materials: I will be using the district-adopted science curriculum, which is Science Education for Public Understanding Program (SEPUP). The curriculum is designed with the idea that not all people will be scientists, but all people need to be able to assess scientific information and use it to make decisions. The curriculum is problem based, with each unit starting with a real-life question. It is also exploratory in nature; we will always explore a topic through labs and modeling before reading about it and naming it.

Supplemental resources: I will put links to recommended supplements on my website. Also, I will occasionally bring in outside resources or supplemental activities that I have written to more closely align our curriculum to the new NGSS standards.

Differentiation/ accessibility strategies and support (TAG, ELL, SpEd, other): MEETING THE NEEDS OF DIVERSE LEARNERS

Our new curriculum has many strategies embedded in it to address the needs of diverse learners.

Students with Learning Disabilities:

- Hands-on activities provide concrete experiences.
- Optional student sheets provide step-by-step procedures for open-inquiry labs.
- Literacy strategies support improvement of reading comprehension and writing skills.
- Discussion strategies facilitate communication.
- Scoring guides state clear assessment goals.

English-language Learners:

- Vocabulary is introduced with operational definitions that connect concepts to learning experiences.
- 4-2-1 cooperative groupings encourage student interactions in an unthreatening environment.
- Discussion strategies enhance speaking and listening skills.
- Literacy strategies strengthen reading and writing skills.

Academically Gifted Students:

- Issues stimulate evaluation of problems in real-world contexts.
- Lab activities encourage students to design complex investigations.
- Scoring guides challenge students to demonstrate their depth of understanding.
- Extension activities encourage in-depth inquiry into related topics.

If you feel like your needs as a learner are not being met, please email me or talk to me in person outside of class. I want you to feel challenged but able to be successful at the same

time. I encourage you to be an active participation in your education by advocating for yourself!

Final proficiencies:

At the end of this course, students should have proficient content knowledge of the standards listed above. Additionally, they should be able to demonstrate proficiency in the eight science and engineering practices.

Essential skills to be taught or assessed:

x	□	Read and comprehend
x	x	Write clearly and accurately
x	x	Listen actively and speak clearly
x	x	Apply mathematics
x	x	Think critically
x	x	Personal management and teamwork
x	□	Use technology
x	□	Civic and Community Engagement
x	□	Global Literacy

Assessment/evaluation/grading policy:

GRADING

This year your child will receive a proficiency grade for science on his/her report card. Progress reports and assignments will be available online the district online grade book.

Students will earn one of the following marks:

Mark	Also Called…	What it Means
Exceeds	EXC or 4	Exceeds expectations. Student has mastered content at a very high level.
Proficient	PRO or 3	Meets expectations. NOT synonymous with a grade of C or "just average."
Developing Proficiency	DEV or 2	Almost meets expectations, but some aspect(s) of the expectations have not been met.
Does Not Meet	DNM or 1	Student may be meeting some aspects of the expectations, but there are significant gaps. More work is necessary to become proficient.

The science grade will be calculated from assignments in three categories: knowledge and understanding, science and engineering practices, and personal management.

Personal Management – EFFORT (1%)

Personal management is a students' ability to plan for and begin working on tasks, complete work correctly and on time, to take responsibility for their actions, to attend class regularly and on time, and to interact with all members of our learning community with respect. All homework will contribute to students' grade in this area, as well as our daily science journal work, and a student's attitude, timeliness, preparedness, and behavior. Students who excel in personal management will excel in schooling and will achieve.

Personal management is counted at 1% so that synergy will calculate a grade so that we can see the effort the student is putting into the course. This will help us when reflecting on our progress and setting goals.

Knowledge and Understanding **(65%)**

Knowledge and Understanding is students' knowledge of science concepts. Assignments that may be graded for achievement include: tests, quizzes, essay questions, some labs, and homework accuracy. In most cases students will be given an opportunity to correct their original assignment, and if it was a test or quiz, to retake it for a revised grade. Some assessments are closed-notebook, and some are not. Students will be notified in advance of any test or quiz as to the content that will be on it and what the policies will be for it.

Science and Engineering Practices **(34%)**

The science and engineering practices are described above and on the NGSS website. In short, they are skills that scientists and engineers employ regularly in their fields, and which are necessary, in addition to content knowledge, for success. These skills will be modeled and practiced in class. They will be assessed primarily through homework assignments, which will be accompanied by a rubric with detailed descriptors of different levels of achievement.

Other Assignment Information:

Late Work

Work that is turned in late will result in a students' grade in Personal Management being reduced.

Dishonesty

Cheating and plagiarism will not be tolerated. You will not receive credit for work that is not your own.

Absences

If you are absent, you are responsible for checking the website calendar to find out what you missed, for checking the extra papers crate to collect your assignments, and for getting caught up. You will have one week from your first day back to complete missed homework.

Correcting Graded Work

Students are encouraged to continue working on graded work to improve it. The most important reason students should consistently do this is to use the information I've given them on the scored work to increase their understanding of the skill or concept. If they are unsure of how or what to do, they should ask me before school, after school, during lunch, or peer tutoring during lunch. Students will be allowed to redo all assessments for increased credit except for unit tests.

Grade Updates

I will update grades as quickly as I can after work has been turned in. You can expect, at a minimum, that work will be graded by a week after its turn in.

For Final Report Card Grade:

At the teacher's discretion, final grades can be adjusted based on score trends over the quarter. An example is if students show improvement over the quarter. If they do, greater weight will be placed on the later scores that show a higher level of understanding and the final grade might be adjusted higher than the Synergy calculated grade.

Behavioral expectations:

Rules:

The following rules apply to all people in our class at all times. They are necessary for everyone to feel safe and to learn as much as possible.

Teamwork
Achieve
Be safe
Organize
Respect

If you violate a rule, you will be assigned a consequence. The following may occur:

- Warning
- Time out
- Parent contact & Detention
- Referral to administrator.

If you ever have a question or concern about rules or consequences, please feel free to talk to me after school, before school, or at lunch.

TARDY and GUM POLICIES

Gum chewing is not allowed at Mt. Tabor Middle School. If a student is observed chewing gum, he/she will be asked to spit it out. If they don't, they will be given a detention.

It is important you be in your seat ready to learn when the bell rings. If you are tardy, I will follow the school policy, which is:

1st time tardy in a quarter	Warning
2nd time tardy in a quarter	Warning
3rd and 4th time tardy in a quarter	Detention
5th time and thereafter	Referral to SMS

Safety issues and requirements:

Students have received a copy of the district-required science lab safety agreement, which details the safety rules for the classroom. Students have been asked to bring it home, and discuss it with their parents. Students and their parents should sign the document and return it to school when they are both clear about the safety requirements for the class.

Contact information:

If you need to contact me my email address is __karras@pps.net_____, and my prep period is ___3rd__ period. You can contact me by phone at ___503-916-5646_ from 8:30 – 8:50, and from 3:50 – 4:00.