
QAHS NEWS BULLETIN

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Understanding by Design-Science GRASPS Activity

Thank you to Erica, Izabella, Shaun, Jeremy, and Daniel from the Social Studies department for sharing their GRASP activity last month. This issue we will highlight the GRASP activities of the science department. Please note if you have yet to be published, we will have an issue of all teachers' GRASPS activities that were not published with their departments in an upcoming issue.

GRASPS Activity: Feedback mechanisms and homeostasis by Tamar Singh

Living things monitor and respond to changes in the environment. Homeostasis (stability) results when the organism detects changes in the environment and responds with a corrective action that returns the organism's systems to normal. For example, regulating human body temperature uses a system similar to a house heating system. A structure in the brain detects a drop in blood temperature. Nerve message is sent to muscles to begin shivering. Shivering generates heat that warms both the body and the blood. Negative feedback occurs as warmer blood reaches the brain sensor to shut off the shivering response.

Students are required to research and design an automatic pet feeder to demonstrate a feedback mechanism. This feeder should maintain a certain amount of food in the bowl at all times and the owner can leave the pet unattended for a weekend without it going hungry. Students may design an automatic water dispenser instead of a feeder since both involve a feedback mechanism. Students need to convince pet owners that they can make a reliable feeder using items such as soda bottles, plastic dishes, tape, glue, etc. Students are required to create a workable model that shows a feedback loop that determines when to dispense food and when to stop. A successful result will show that the feeder is workable and can be made by a pet owner.

This is a work in progress. Students are currently researching different types of pet feeders and coming up with various designs. Only one student has seen an automatic pet feeder but they all agree that it involves a feedback mechanism that allows it to dispense a certain amount of food at a time. Final write up and construction is to be done during the winter break. The finished product should clearly show a feedback loop, and students must be able to relate to it maintaining homeostasis in living organisms. By designing and making this feeder, students will understand that various systems in the living organisms detect deviations from the normal state and take corrective actions to restore homeostasis.

This **GRASPS Activity** (created by Amelita S. Dayao) in Chemistry is to be performed toward the end of the chapter on Atomic Structure. The students should have already learned what ions are and how they are formed. A lesson on how compounds are formed when ions combine should precede this activity.

IONIC CARD GAME

Supposed you work in a Chemistry Classroom Resources company. You are in charge of creating and designing instructional materials and resources that teachers and students can use in the classroom.

GOAL:

Your task is to create an IONIC CARD GAME that the teacher can use to assess students' learning of the concept of ions and compound formation.

ROLE:

You have been asked to design a card game where students can apply the lesson they learned on compound formation.

AUDIENCE:

Your clients are high school students taking Chemistry.

SITUATION:

The challenge is how to formulate the mechanics of the game such that scoring will be easy and the game rules will not be confusing. Also, you have to create a card game that will be interesting and engaging to the students.

PRODUCT, PERFORMANCE, and PURPOSE:

- You need to design game cards that will be attractive to the students.
- Your finished product should be made of high quality materials that can withstand repeated use.
- The game rules must be complete but simple and clear enough to follow.
- A score sheet must be included in the card game package.

STANDARDS and CRITERIA for SUCCESS:

Your card game will be evaluated by the rest of the class according to the following criteria:

- Ease of playing the game
- Usefulness of the game in terms of applying the concept learned
- Clarity of the game rules
- Interesting and engaging to students
- Creativity and artistry of the cards made

SIDEBAR

In the next bulletin we would like to highlight our English teachers' GRASPS activities. Please note that Understanding by Design is a year-long professional plan.

If you have reached out to parents and students are still not properly prepared for school, please give a list to Bill and Derek. All students must have the required materials – binder, not a notebook, loose-leaf paper, dividers, pens, and pencils.

Case Conferences will be held on Monday, February 22nd from 3:05 p.m. to 4:05 p.m. These meetings will now be referred to as Teacher Inquiry Teams. Before each meeting teachers will identify students who are struggling academically in classes. **Students who exhibit solely attendance or behavioral issues will not be discussed at these meetings.** Teachers who work directly with the students would attend these meetings to discuss student's strengths and weaknesses based upon data, identify strategies implemented and tried successfully, provide samples of student's work, and create action plans with specific objectives and time frames to check student's progress. These students would be followed over a period of time to monitor progress and revise action plans if need be.

School Improvement Team (SIT) meets Monday (F) and Wednesday (J) this week from 3:30 p.m. to 5:30 p.m. Thank you to all teachers for your input on what we need to improve in our school. The team will be working to address the areas of the survey.

February 23rd – Good News Phone Call Day – please make these calls as they do have a positive affect on students.
Binder Check Day – It is early in the semester and a good time to ensure that students' notebooks are organized and materials from last semester have been removed.

February 24th – Random collection of student portfolios

February 25th –
**PROGRESS REPORTS AND LSS
RECOMMENDATIONS ARE DUE**
COSA Meeting - Jamaica
Inquiry Team Meeting – Jamaica

March 3rd – Periodic Assessments – English and math

March 5th - Pratt Institute

Please let Beverly know when you are conducting student conferences as I would like to join you.

GRASPS Activity - Earth Science - by David Benz

This activity is planned for the conclusion of a unit on topographic maps. Students will examine a map showing elevations at various locations. Their role will be a ski/snowboard resort developer. Their audience will be developers seeking to invest in and develop the land parcel for this purpose. Using contour lines, the students will lay out ski trails that will fit four ability levels for skiers. These are: green circles showing the easiest way down the mountain (least steep); blue squares showing an intermediate difficulty level of mixed terrain; black diamonds showing advanced, steep terrain and lastly, double-black diamonds, showing the steepest terrain for experts only. The students will be required to layout an assortment of at least 3 trails at each of the lower levels and one or two trails at the most difficult level for a total of 10-11 ski trails.

In addition, ski lifts are extremely expensive to purchase, install and maintain. In an effort to minimize these costs students will need to select two locations where lifts can be installed that can transport skiers to the summit from one of two base locations. The selected base locations should be the shortest distance between the base and the summit as they accomplish this requirement.

Some of the research for this proposal will come from Skilifts.org. This is a website that shows companies that manufacture, install, and maintain ski lifts of various designs.

GRASPS Activity – Living Environment - Designer Babies – Angeleke Lymberatos

This activity will be done at the completion of the Genetics Unit. In this lesson, students will synthesize their knowledge of Mendel's laws, codominance, incomplete dominance, and reproduction to complete a designer babies activity.

In this activity, students will complete punnett squares to determine the possible zygotes for different traits from the two parents, and then "design" their baby by choosing the phenotypes they desire for their baby. The activity is completed when the student draws what the baby they designed looks like.

The students take on the role as Genetic counselors that will inform parents of what their future baby may look like. The students will write an essay on the following question:

If the technology for designer babies were available in the future, would you want to create a designer baby? Why or why not?