

Course: Environmental Science

Habits of the Graduate:

Know Yourself, Know Your Role, and Know Your Goal

Marking Period 2 – What are my strengths/weaknesses; Steps for improvement

Title of Lesson: Understanding Your Health

NJCCCS: 5.3.6.A1, A3

Objectives: Identify the three key components of physical health
Recognize the effects of good and bad choices regarding health
Identify support programs within EHS for students

Procedures:

1. We will take a survey of the students at the beginning of the period asking how many hours of sleep they had last night and what they had for breakfast.
2. The results of the survey will be anonymously reported on the board so that the class can compare their results with those of their classmates.
3. We will use the class results to calculate the class average for each category.
4. Students will be presented with the government recommendations for...
 - a. Sleep – Adults 7-9hrs; Adolescence 8-9hrs
 - b. Exercise – 30 min 3-4 days per week
 - c. Diet – Use the FDA food pyramid\
5. Using the class average we will identify if Edison High School students, on average, are meeting the government recommendations. We will stress that being successful as an EHS student is significantly more difficult if they do not meet the minimum requirements of physical health.
6. Toward the end of this lesson students will be given a list of resources which are available to them as students including after school tutoring by the National Honor Society, guidance counselors, small group meetings, mentor program, and the school psychologist/crisis counselor.

Closure: Students will be given a scenario in which a friend of theirs is struggling with a specific issue and they must make suggestions as to how the student can manage his/her current problem and who they could turn to for support.

Assessment: Students will be assessed through their exit tickets as well as part of their traditional quiz and tests which include this information.

Modifications: Redirect attention, graphic organizer, frequent checks for understanding

Course: Environmental Science

Instructor: DuBois / Murtagh

Habits of the Graduate: Know Yourself, Know Your Role, and Know Your Goal.

Habits of the Graduate: Marking Period Focus Questions: What are my strengths/weaknesses? What steps do I need to take to improve?

Title of Lesson: My Impact on the Environment and the School Community.

NJCCS:

- 5.4.12.G.2
- 5.3.12.C.2
- 5.1.12.D.1
- 5.1.12.D.2

Objectives:

- Students will analyze their roles on their environment.
- Students will learn methods that they can live a “greener” life to help the environment that they live in.
- Students will analyze their role within Edison High School and set future goals for their educational career.

Procedure:

- Students will use laptops to complete an online activity to determine their Ecological footprint based on information about their personal lives.
- When students have completed the activity, they will be presented with information on how many Earths it will take to support a world of “thems” as well as how they compare to average citizens in other countries.
- Students will then brainstorm ways that they can reduce their ecological footprints at home.
- Students will then fill in the “Habits of the Graduate” questionnaire to examine their role within Edison High School and the surrounding community.
- Students will then compare their answers to the questionnaire with another student to see how they compare with other students at Edison High School.

Closure: Students will be given an exit ticket on the average statistics of students at Edison High and their involvement in the school. Students will need to set 1 goal on how they will reduce their ecological footprint in their personal lives as well as 1 goal on how they will increase their involvement in Edison High School

Assessment:

- Ecological Footprint Online Activity
- Habits of the Graduate Questionnaire

Course : Biology

Instructor: M. Anderson, A. Chhibber, J. Hammer, B. McBrierty

Habit of the Graduate: Accepting the Personal Challenge

Marking Period 2 Question: What steps am I taking to better myself physically?

Title of the Lesson: Cell Cycle and Cancer

NJCCCS: 5.3.12.A.3, 5.3.12.A.6

Objectives:

SWBAT:

- Describe how cell cycle is controlled in eukaryotic cells
- Relate the role of the cell cycle to the onset of cancer
- Synthesize a list of behaviors that could decrease their exposure to carcinogens

Materials:

Student summary handouts

Student jigsaw materials

Highlighters

Ticket out

Procedure:

1. Students will receive handouts and will together read resource #1 and highlight important information.
2. As a class, students will come up with a 1 sentence summary for resource #1.
3. Students will then be assigned one additional resource #2-6. In groups, they will come up with a one sentence summary for their resource.
4. They will return to their original group and be responsible for teaching the rest of the group about their resource.
5. TW circulate and assist as needed. After about 20 minutes, TW call on any random student to provide summary of a resource on board. Repeat for all resources.
6. SW create a list of behaviors/ substances that would increase the likelihood of developing cancer in a lifetime.
7. TW collect all summaries for assessment.

Closure:

Ticket out : Describe one way that you can decrease your chances of getting cancer today.

Assessment: Student summary handouts, ticket out

Modifications: Group students in heterogeneous groups, provide easier language/resource to struggling students, modeling completion of first resource

Course: Chemistry

Date:

Instructor: Evans, Hu, Mathai, Kozbial

Habit of the Graduate (Choose 1):

- Know Yourself, Know Your Role, and Know Your Goal
- Accepting the Personal Challenge
- Invest in Yourself: Be Your Best Today to Be the Best for Tomorrow
- Be a Positive Influence in Your School Community

Habit of the Graduate: Marking Period Focus Question:

Look back at the vision you drew at start of school year. Identify where you can seek out resources to support your vision.

Title of Lesson: Atomic theory

NJCCCS: 5.1.A, 5.1.B, 5.2.B, 5.4.D, 5.6.A

Objectives: SWBAT understand shortcomings and the need for revisions to atomic theories.

Procedure:

1. Jigsaw
 - a. Each group of 4 students will be assigned one model/theory and will become an expert on their model/theory.
 - b. Computers and other resources will be provided.
 - c. Teacher will ask questions and go through groups to make sure there is understanding.
2. Each group will present their model/theory.

Closure:

Reflect on the hardships on these scientists and think of a time when you also had to overcome hardships in your life.

Assessment:

Question by teacher in groups/answers by each student.

Modifications:

Extended time

Clarify directions

Read out loud

Course: AP Biology
Instructor: J. Przygoda

Date: 2 periods

Habit of the Graduate (Choose 1):

- Know Yourself, Know Your Role, and Know Your Goal
- Accepting the Personal Challenge
- Invest in Yourself: Be Your Best Today to Be the Best for Tomorrow
- X Be a Positive Influence in Your School Community

Habit of the Graduate: Marking Period Focus Question:

Reflect back on your high school experience? What advice can I give to the underclassmen to help them soar?

Title of Lesson: Chapter 17 – From Gene to Protein
NJCCCS: 5.3.12.D.2

Objectives:

- Students will demonstrate an understanding of the chemical processes involved in transcription and translation.
- Students will demonstrate understanding of similarities and differences in prokaryotic and eukaryotic gene expression.

Procedure:

- Students will come to class having read the chapter as assigned previously.
- Students will work in table groups to discuss what is already known about DNA transcription and translation. “Was the reading in the book more detailed than what you learned in your previous (10th grade) biology class? How is it different?”
- Teacher will lead students guided notes for chapter 17.
- Students will work in their table groups to revisit the questions about previous biology courses. They will compile a list of topics that they learned in 10 grade bio and are using again here in AP Biology.
- Students will review all of these topics as a class and come up with 5 pieces of “Biology Advice” for the underclassmen. Advice will be listed on chart paper and shared with underclassmen.

Closure:

Students are given a small segment of DNA to transcribe and translate.

Assessment:

Students will complete the chapter 17 quiz tomorrow in class.

Modifications:

Modifications will be based on the needs of students in the current class.

Course: Physics 1
Instructor: K. Patel

Habit of the Graduate:

Be a positive influence in your school community

Habit of the Graduate: Marking Period Focus Question:

MP2: Reflect back on your high school experience. What advice can I give to the underclassmen to help them soar?

Title of Lesson: Newtonian Dynamics

NJCCCS: 5.1.12.A.2, 5.1.12.B.2, 5.1.12.D.1, 5.1.12.D.2, 5.2.12.E.4, 5.2.12.E.3

Objectives:

- SWBAT define the term force
- SWBAT determine the direction of F_{NET}
- SWBAT draw Free Body Diagrams
- SWBAT describe Newton's Laws of Motion

Procedure:

Students will derive Newton's 2nd Law of Motion, Newton's 1st Law of Motion (in that order, as that is how Newton did)
Conduct each demonstration, having students note their observations in their groups after each demonstration
Students will pick any patterns in what they observed. These patterns are described verbally and mathematically
Students will create explanations
Students will test their explanation, modify/change our explanation in their testing data does not support their explanation

***(HOTG)Ask students:**

How would you have looked at this situation as a Freshman? Sophomore? Junior? - they would have memorized material

What are you doing differently now? (At this point, this is how we develop all the concepts in physics class) – being an active observer, being engaged, thinking critically, problem solving

Formative Assessment:

Complete worksheet

Modifications:

Using multiple representations: physical demonstrations, free body diagrams, pictorial representations, mathematical representations

OBSERVATIONS:

1. Demonstration: Skate with constant velocity
The instructor moves with constant velocity when there is no unbalanced force
2. Demonstration: Skate into the teacher's desk, or end by pushing into someone's outstretched palms
The instructor moves with non-constant velocity (accelerated motion) when there is an unbalanced force.

The direction of the acceleration is the direction of the unbalanced force
3. Demonstration: Someone pulls instructor on blades, then pulls harder
The instructor moves with greater acceleration when the net force is greater
4. Demonstration: Someone pulls instructor on blades, then pulls the same after instructor puts on backpack
The instructor moves with less acceleration when the mass is greater

EXPLANATION: mathematically described: $\mathbf{a} = \mathbf{F}_{\text{NET}}/m$

TESTING EXPERIMENT:

Show student's the pair experiment: Atwood's Machine with Spring Scale Part 2: Qualitative Testing Experiment.

Have students predict qualitatively what the scale should read when Mr. Largo lets go of the object he is holding. Prediction should be in IF...AND...THEN... form.

IF $\mathbf{a} = \mathbf{F}_{\text{NET}}/m$, AND we set up an Atwood Machine with a 200g object on one side and a 300g object with a scale on the other, THEN when we let go of the 200g object, the scale should read a value that is less than the $\mathbf{F}_{\text{EARTH ON ORANGE AND BLUE}}$.

When not accelerating, $\mathbf{F}_{\text{NET}} = 0$ SO, $\mathbf{F}_{\text{SCALE ON ORANGE AND BLUE}} = \mathbf{F}_{\text{EARTH ON ORANGE AND BLUE}}$
When Mr. Largo lets go, $\mathbf{F}_{\text{NET}} \neq 0$ Direction of \mathbf{a} is down, so \mathbf{F}_{NET} has to be downwards

NOW, $\mathbf{F}_{\text{SCALE ON ORANGE AND BLUE}} + \mathbf{F}_{\text{EARTH ON ORANGE AND BLUE}} = \mathbf{F}_{\text{NET}}$
 $\mathbf{F}_{\text{EARTH ON OBJECT}}$ does not change (it can't!)

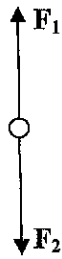
$\mathbf{F}_{\text{SCALE ON ORANGE AND BLUE}} + (-\mathbf{F}_{\text{EARTH ON ORANGE AND BLUE}}) = m(-\mathbf{a})$
 $\mathbf{F}_{\text{SCALE ON ORANGE AND BLUE}} = \mathbf{F}_{\text{EARTH ON ORANGE AND BLUE}} - ma$

Thus, the $\mathbf{F}_{\text{SCALE ON ORANGE AND BLUE}}$ has to read less than before, less than $\mathbf{F}_{\text{EARTH ON ORANGE AND BLUE}}$

(Student Handout: Formative Assessment):

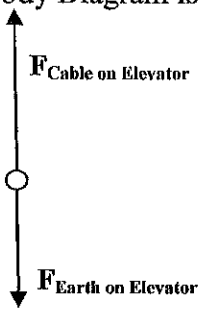
1. When does an object NOT accelerate?

2. Describe this particle's motion.

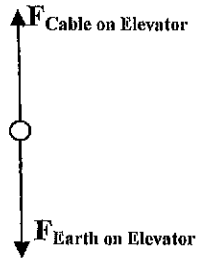


3. A hockey puck is hit and slides across the ice at 5 m/s for 5 seconds. What is the acceleration of the hockey puck during this time?

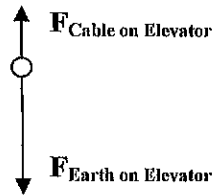
4. An elevator is suspended by a cable. The elevator is moving upward and slowing to a stop. Which Free Body Diagram is correct?



(A)



(B)

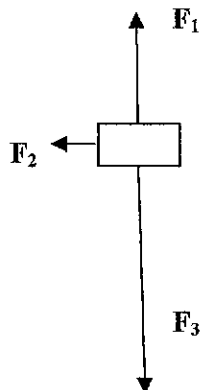


(C)

$F_{\text{Net}} = 0$

(D)

5. In which direction does the object below accelerate?



Problem A:

What net force is required to accelerate a 1500-kg race car at $+3.00 \text{ m/s}^2$?

What is the UNIT used for the quantity of Force?

Problem B:

An artillery shell has a mass of 55 kg. The shell is fired from a gun, leaving the barrel with a velocity of +770 m/s. The gun barrel is 1.5 meters long. Assume that the force, and thus the acceleration, of the shell is constant while the shell is in the gun barrel. What is the force on the shell while it is in the gun barrel?

Conceptual: Since all objects free-fall with constant acceleration (neglecting air resistance and assuming experiments were conducted over relatively short heights, close to Earth's surface), what must the force of gravitational attraction from Earth be proportional to?