CANDIDATE WORK SAMPLE

Carmel Clay Middle School

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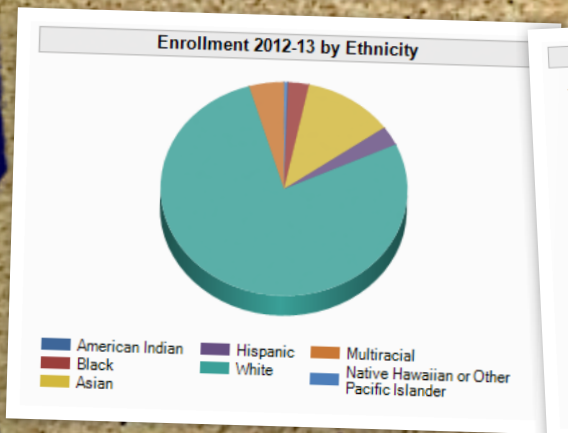
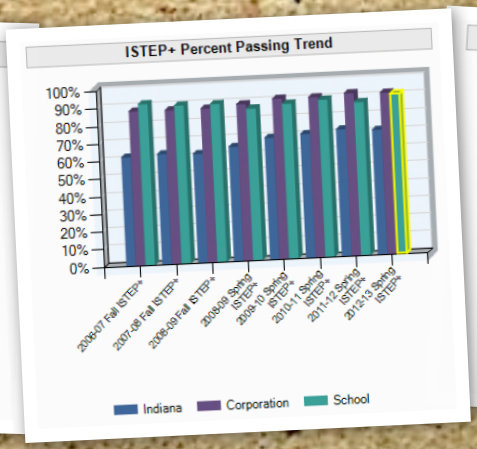
Clay Middle School

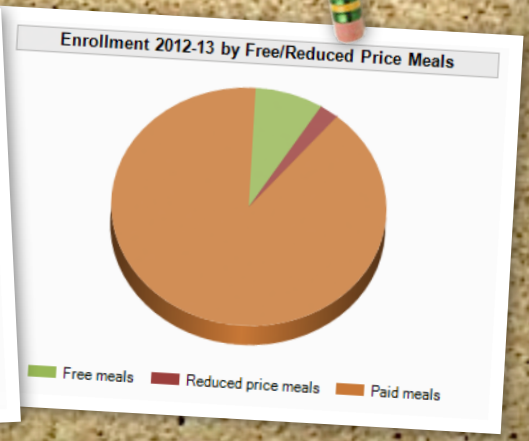
Carmel, Indiana

Coordinating Teacher: Gretchen Smiley

8th and 6th Grade Science







- Clay Middle School is a state-recognized Four Star School located in suburban Hamilton County in Carmel, Indiana
- There are currently 1,200 students enrolled in the school. 73 teachers work at Clay, and the student to teacher ratio is 18:1.
- The school has received the accountability letter grade of "A" by the state of Indiana for the past 2 years.
- The school motto is, "Building respect and responsibility for individual achievement and development while growing through teamwork, exploration, and high expectations.
- I had the opportunity of working with both the 6th and 8th grade science classes of Clay. In Ms. Smiley's 6th grade class I planned units and instructed lesson on matter and astronomy, while in the 8th grade class I planned units and instructed lessons on evolution and genetics.

Unit Plan for 8th Grade Genetics

Standards:

Indiana Science Standards 2010 (Carmel Clay) : 8.3.1, 8.3.2, 8.3.3, 8.3.4, 8.3.5, 8.3.7, 8.3.8, 8.3.9, 8.3.10

What should students know, understand, do, and believe?

Long Range Goals and Objectives

Know...

- Identify the role of alleles and the inheritance of traits.
- Identify three factors affecting natural selection.

Understand...

- Understand that scientific knowledge is empirical.
- Scientific knowledge is open to revision.
- Understand science explains natural phenomena.

Do...

- Describe how Darwin's observations helped him to develop his hypothesis of evolution by natural selection.
- Explain how natural selection leads to evolution.
- State evidence that support the theory of evolution.
- Explain how new species form.
- Define and give examples of adaptations.

Do...

- Compare and contrast gradualism and punctuated equilibrium.
- Describe the results of Mendel's experiments.
- Define probability and its relationship to genetic traits.
- Define and explain phenotype and genotype.
- Explain the difference between acquired and inherited traits.
- Define and explain dominant, recessive, homozygous, heterozygous genes.
- Analyze and create a Punnett square to determine traits.
- Describe how mutations can be helpful/harmful to an organism.

Big Ideas

Understanding the Nature of Science

Evolution
Living things change over time.

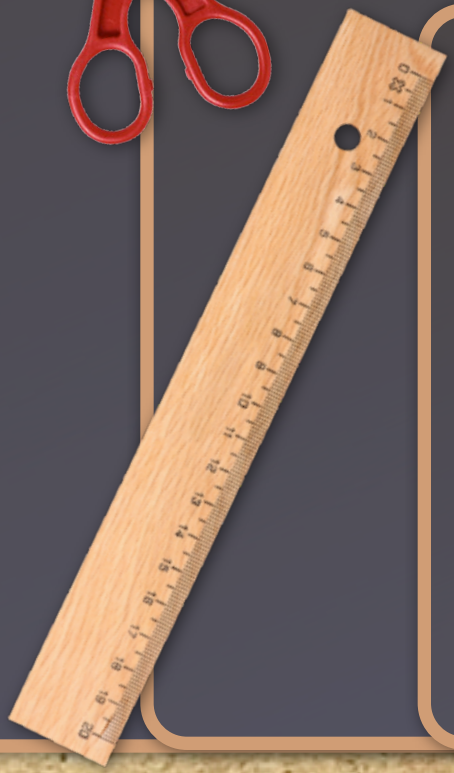
Genetics
Genetic information is passed from parents to offspring.

Essential Questions

How do living things change over time?

How are traits passed from parent to offspring?

What evidence is scientific knowledge based on? Does scientific knowledge change?



Enduring Understandings

Science is a framework for how we understand and examine the world around us. Evolution, or change over time, by natural selection is how science explains the diversity of life on our planet. Genetics, the study of inheritance of DNA material from parent to offspring, is interconnected to evolution.

Student Activities

- Chalk Talk
- Socratic Seminar (Full class and small group)
- Lab Activities

Assessments

Formative

- Notebook Checks
- Thumbs Up/Down
- Entrance Slips
- Homework Checks
- Observe-Listen
- Pretest

Summative

- Quizzes
- Unit Post Test
- Lab Write-Up

Assessment Plan

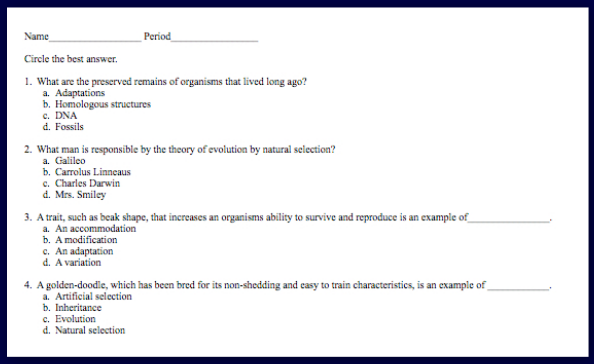
Examples of Assessments used throughout Genetics Unit

Formative

- Pretest
- Entrance Slips
- Thumbs Up/Thumbs down
- Post-it Note Protocol
- Notebook Checks
- Lab Work Checks
- Class Participation

Summative

- Post Test
- Quiz
- Lab Report/Post Lab



Name_____ Period_____

Circle the best answer.

1. What are the preserved remains of organisms that lived long ago?
   a. Adaptations
   b. Homologous structures
   c. DNA
   d. Fossils

2. What man is responsible by the theory of evolution by natural selection?
   a. Galileo
   b. Carrolus Linneaus
   c. Charles Darwin
   d. Mrs. Smiley

3. A trait, such as beak shape, that increases an organisms ability to survive and reproduce is an example of_____.
   a. An accommodation
   b. A modification
   c. An adaptation
   d. A variation

4. A golden-doodle, which has been bred for its non-shedding and easy to train characteristics, is an example of _____.
   a. Artificial selection
   b. Inheritance
   c. Evolution
   d. Natural selection

Figure 1. Entrance slip used in class to assess students comfort with material. This was used as a low risk assessment to inform my instruction the day after a mini-lecture to gauge student understanding.

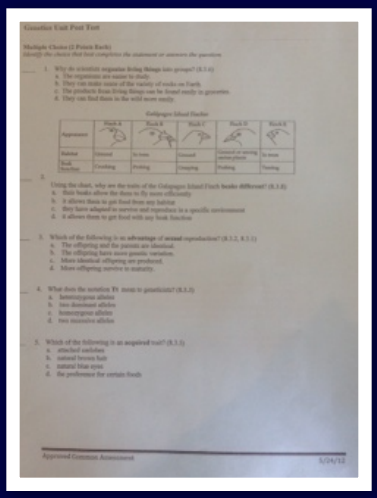
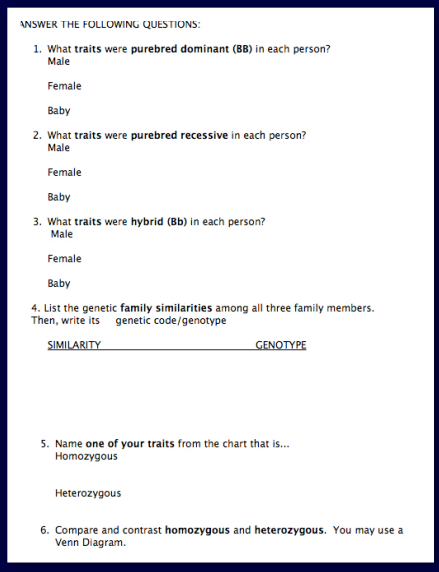


Figure 2. Posttest used as summative assessment for the genetics unit. This assessment was given at the completion of the unit and compared to the pre-test to gauge student learning gains and instructional impact.

Figure 3. Students indicate with a thumbs up/ thumbs middle/ thumbs down their comfort level with the material. This low risk assessment helped me to understand pacing for the lesson.

Figure 4. Students used post-it notes to record the "Most Valuable Point" from the lesson. At the conclusion of the activity, we brought all the post-it notes together to establish big themes. This is a low risk activity which helps me to identify if there are any gaps in student understanding.



ANSWER THE FOLLOWING QUESTIONS:

1. What **traits** were **purebred dominant (BB)** in each person?
   Male

   Female

   Baby

2. What **traits** were **purebred recessive** in each person?
   Male

   Female

   Baby

3. What **traits** were **hybrid (Bb)** in each person?
   Male

   Female

   Baby

4. List the genetic **family similarities** among all three family members. Then, write its genetic code/genotype

   SIMILARITY GENOTYPE

5. Name **one of your traits** from the chart that is...
   Homozygous

   Heterozygous

6. Compare and contrast **homozygous** and **heterozygous**. You may use a Venn Diagram.

Figure 5. Post-Lab assignment used as summative assessment for students after the completion of the Baby Lab.

Design for Instruction

Sample Lesson Plan from Genetics Unit

Thursday, February 6, 2014

Unit: Genetics

Lesson 15

Big Ideas

Genetic information is passed from parent to offspring.

Living things change over time: Evolution

Living things are alike yet different

Objectives

1. Students will be able to understand how new species form and explain this in discussion.
2. Students will be able to compare and contrast models of evolution (gradualism and punctuated equilibrium)

Materials

Science Notebook

Science Book

Rate of Change Lab

Low-risk discussion with peers to draw upon prior knowledge. This will form the foundation for new content given during the lesson.

Content area vocabulary identified.

Procedures/Strategy

1. Students will enter the room and take down the I can statements in their notebooks. Teacher will preview the days activities.
   - How do organisms change over time though natural selection Think/Pair/Share
   - Students share out to class the links between natural selection and evolution.
2. Activation of prior knowledge (Engage): Discussion
   - How do new species form?
   - Reading on Kaibab squirrels and Cricket activity
     - Discuss why did they evolve so quickly?
     - How did they evolve?
     - Is this an example of natural or artificial selection?
3. Explore: Reading on the species Molluscaformis and Pedivarious prep for fossil activity
   - Where do we find fossils?
   - What do fossils show us?
   - Is there a complete fossil record?
4. Explain: a Peek at the Past activity
   - Students receive copies of....
     - 2 organism sheets
     - Timelines
     - Work sheets
5. Elaboration: Discussion of questions
6. Evaluation: Create a graph of the species change over time.
7. Have students write down a word or idea they are having trouble with and submit it.

Use of the 5 E cycle: Engage, Explore, Explain, Elaborate, and Evaluate.

Connections to prior knowledge.

Differentiation occurs here in grouping and interactive modeling activity.

Content Vocabulary

Gradualism

Punctuated Equilibrium

Students internalizing the activity in their science notebooks which meets lesson plan objectives.

Evaluation

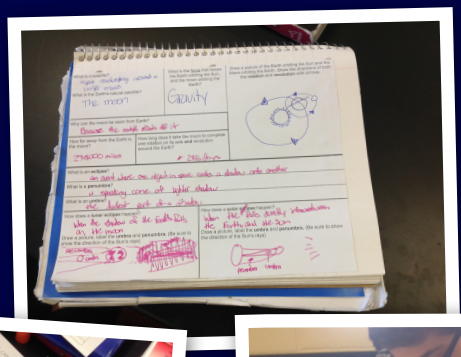
1. Formative

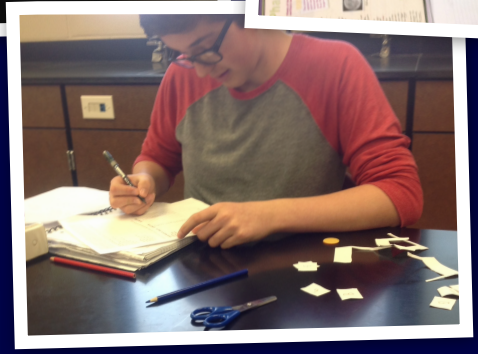
   Discussion answers, completion of activity, graphing the characters change over time.
2. Summative

   Quiz next week Tuesday, February 11

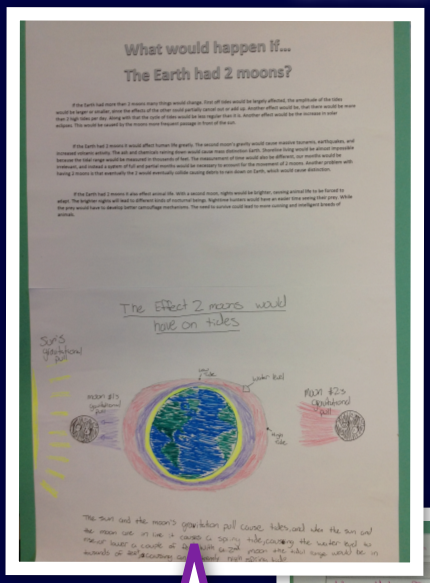
Extensions/Next Steps

- To reinforce this idea, students will be assigned the reading as homework. Follow up with students for confusion with question slips
- Next lesson, adaptation activity.
- Homework: Reading and text boxes on 296-299. Vocabulary due tomorrow.

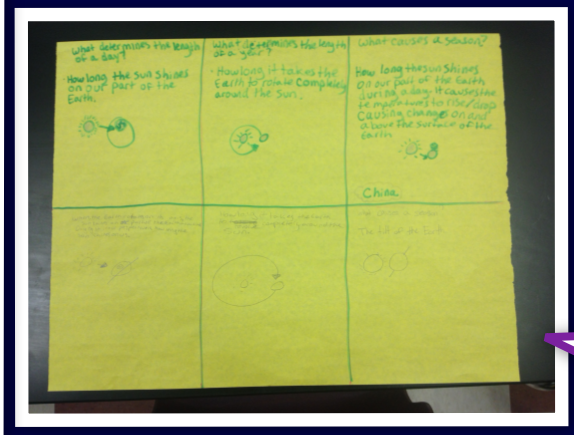




Instructional Impact



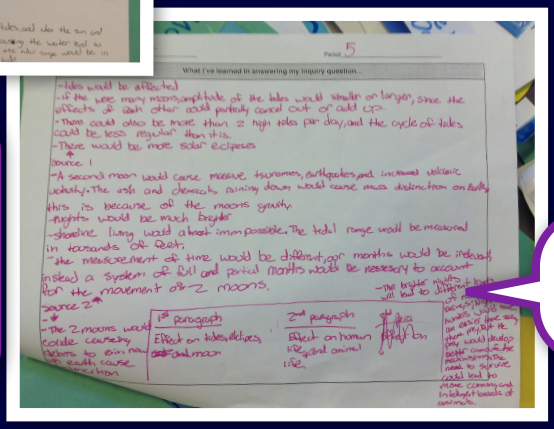
Student applied their knowledge in a guided inquiry assignment to answer a higher level question. The product was then used as reference during future lessons on astronomy.



6th Grade Assessments for Astronomy Unit

Graphic organizer identifying misconceptions prior to the lesson and knowledge gains after lesson.

Students filled in the top half answering three questions before the lesson. Then after the unit, returned to the organizer to correct their misconceptions. This also informed my planning for targeted instruction.

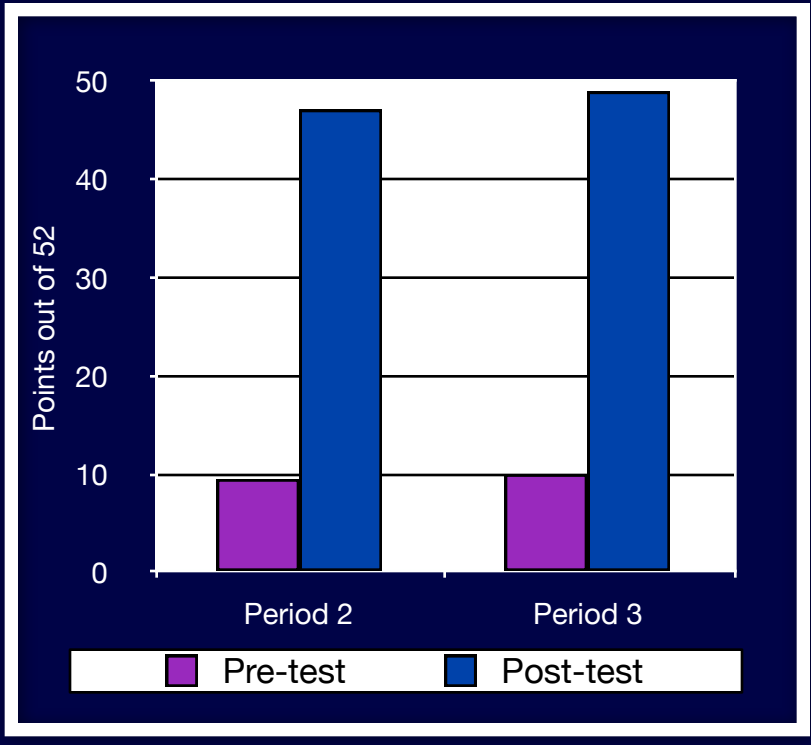


KWPL page completed by student during the inquiry project. Student completed the "What have I learned?" section as their notes from research.

8th Grade Summative Assessment for Genetics Unit

- Mix of multiple choice and free response questions.
- Maximum score for both exams of 52 points.

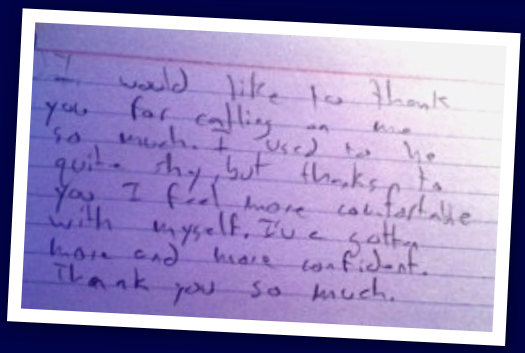
- Period 2
  - Pretest Average: 9 points.
  - Posttest Average: 47 points.
- Period 3
  - Pretest Average: 10 points.
  - Posttest Average: 49 points.



Analysis and Reflection

My students improved in their knowledge of science content and their ability to think like a scientist through the lessons and inquiry projects we completed.

My 8th grade students showed an average increase of 71% from the pretest to the posttest.



While the 6th graders gained an appreciation for inquiry and research demonstrated by their higher level questioning and creative application of content knowledge in their inquiry assignments. Importantly, this also demonstrated an increased comfort with the nature of science.

Through my student teaching experience at Clay, I learned how to differentiate based on individual student needs, to plan based on student interest and response in assessments, and to guide student inquiry.

In addition I learned that fostering an environment of respect for different ideas and creative questioning, leads to significant risk taking in learning which benefits the classroom community.