LESSON PLAN

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Content Area: Science  
Unit Topic: Dinosaurs & Fossils

Today's Lesson: (# 5) Extinction of the Dinosaurs  
Grade Level: 2

Duration: 60 - 75 minutes

LESSON RATIONALE

New York State Learning Standards and Key Ideas:

Mathematics, Science, and Technology

Standard 1: Students will use mathematical analysis, scientific inquiry, and engineering design, as appropriate, to pose questions, seek answers, and develop solutions.

Scientific Inquiry: (1) The central purpose of scientific inquiry is to develop explanations of natural phenomena in a continuing, creative process.

Standard 3: Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.

Number and Numeration: (2) Students use number sense and numeration to develop an understanding of the multiple uses of numbers to communicate mathematically, and the use of numbers in the development of mathematical ideas.

Operations: (3) Students use mathematical operations and relationships among them to understand mathematics.

Modeling/Multiple Representation: (4) Students use mathematical modeling/multiple representation to provide a means of presenting, interpreting, communication, and connecting mathematical information and relationships.

Measurement: (5) Students use measurement in both metric and English measure to provide a major link between the abstractions of mathematics and the real world in order to describe and compare objects and data.

Patterns/Functions: (7) Students use patterns and functions to develop mathematical power, appreciate the true beauty of mathematics, and construct generalizations that describe patterns simply and efficiently.

Standard 4: Students will understand and apply scientific concepts, principles and theories pertaining to the physical setting and living environment, and recognize the historical development of ideas in science.

The Living Environment: (1) Living things are both similar to and different from each other and non-living things.

(3) Individual organisms and species change over time.

(6) Plants and animals depend on each other and their physical environment.
English Language Arts
Standard 1: Language for Information and Understanding: Students will read, write, listen, and speak for information and understanding. As listeners and readers, students will collect data, facts, and ideas; discover relationships, concepts and generalizations; and use knowledge generated from oral, written, and electronically produced texts. As speakers and writers, they will use oral and written language that follows the accepted conventions of the English language to acquire, interpret, apply, and transmit information.

Listening and Reading: (1) Listening and reading to acquire information and understanding involves collecting data, facts, and ideas; discovering relationships, concepts, and generalizations; and using knowledge from oral, written, and electronic sources.

Speaking and Writing: (2) Speaking and writing to acquire and transmit information requires asking probing and clarifying questions, interpreting information one’s own words, applying information from one context to another, and presenting the information and interpretation clearly, concisely, and comprehensibly.

Standard 2: Language for literary response and expression: Students will read and listen to oral, written, and electronically produced texts and performances from American and world literature; relate texts and performances to their own lives; and develop an understanding of the diverse social, historical, and cultural dimensions the texts and performances represent. As speakers and writers, students will use oral and written language that follows the accepted conventions of the English language for self-expression and artistic creation.

Speaking and Writing: (2) Speaking and writing for literary response involves presenting interpretations, analyses, and reactions to the content and language of a text.

Speaking and writing for literary expression involves producing imaginative texts that use language and text structures that are inventive and often multilayered.

Standard 3: Language for critical analysis and evaluation: Students will listen, speak, read, and write for critical analysis and evaluation. As listeners and readers, students will analyze experiences, ideas, information, and issues presented by others using a variety of established criteria. As speakers and writers, they will use oral and written language that follows the accepted conventions of the English language to present, from a variety of perspectives, their opinions and judgments on experiences, ideas, information and issues.

Listening and Reading: (1) Listening and reading to analyze and evaluate experiences, ideas, information, and issues requires using evaluative criteria from a variety of perspectives and recognizing the difference in evaluations based on sets of criteria.

Speaking and Writing: (2) Speaking and writing for critical analysis and evaluation requires presenting opinions and judgements on experiences, ideas, information, and issues clearly, logically, and persuasively with reference to specific criteria on which the opinion or judgement is based.

Standard 4: Language for social interaction: Students will listen, speak, read, and write for social interaction. Students will use oral and written language that follows the accepted conventions of the English language for effective social communication with a wide variety of people. As readers and listeners, they will use the social communications of others to enrich their understanding of people and their views.

Listening and Speaking: (1) Oral communication in formal and informal settings requires the ability to talk with people of different ages, genders, and cultures, to adapt presentations to different audiences, and to reflect on how talk varies in different situations.
Social Studies
Standard 2: Students will use a variety of intellectual skills to demonstrate their understanding of major ideas, eras, themes, developments, and turning points in world history and examine the broad sweep of history from a variety of perspectives.

World History: (4) The skills of historical analysis include the ability to investigate differing and competing interpretations of the theories of history, hypothesize about why interpretations change over time, explain the importance of historical evidence, and understand the concepts of change and continuity over time.

Instructional Objectives:

1. Students will develop an understanding of scientific theory. (Comprehension)
2. Students will learn about the most popular theories for the extinction of dinosaurs, and will formulate their own opinion/theory based on what they have learned. (Comprehension, Synthesis, Evaluation)
3. Students will plot their own choices of theories on a graph, and will answer questions based upon the results. (Application, Analysis)

Adaptations: Heather and Charles will work in small groups of three with Lisa, Patty, Alex, and Andrew when researching the theories for extinction. Robert and Ken will sit in the front of classroom where lesson is being taught from. The classroom aide will generate a written copy of the theories of extinction from the board for Robert to keep at his desk, and he will receive additional support from the classroom aide and teacher as needed. Mary will read to her group the article from the teacher’s resource packet: “How Did the Dinosaurs Die?” (p 37), and lead them in their research discussion.

Materials:

1 ½ inch square pieces of construction paper, 22 each of red, orange, yellow, green, blue, purple, and black
chart paper (lined), tape, thick black marker
Exploration of Dinosaurs pp 1 and 22 worksheets (“Dinosaur Notes” and “Dinosaurs”)
Exploration in Dinosaurs Teacher’s Resource Packet pp 38 and 39 worksheets (“What Do You Think Happened to the Dinosaurs?” and “Where Did They Go?”)
Wee Sing Dinosaurs cassette tape
journals
Books for research:
  Magic School Bus in the Time of the Dinosaurs
  The Dinosaur Alphabet Book
  Dinosaurs (Jeunesse)
  Hunting the Dinosaurs
  Dinosaurs (Maynard)
  Exploration in Dinosaurs article “How Did the Dinosaurs Die?” (p37)
LESSON OPENING

Anticipatory Set

Say: Please take out your journals and turn to the story that you wrote for our last lesson about when the dinosaurs lived. Who would like to share their story with the class? (Call on volunteers until there are no more, then ask if necessary:) Who has not yet shared their story? (Ask these students to share—offer to read or have someone else read their story as a last resort. As students read about the “imagined” environment of their dinosaurs, write the characteristics mentioned on the side chalkboard.) [Guided Practice]

Say: Who can tell me what the word extinct or extinction means? (Call on volunteers and write only the correct information given on the board; write in any information missing)

- extinct: died out or no longer exists
- extinction: the dying out or disappearance of a plant or animal species
- species: a group of living things that are the same in many ways

Say: Who remembers the definition of the word theory from our spelling list? (Call on volunteers and write definition on board)

- theory: a possible explanation [Checking for Understanding]

LESSON BODY

Activities:

Factstorming–variation (Stephens and Brown, 2000)

1. Pass out “Dinosaurs” worksheets. Read the directions and have students follow along. [Modeling] Have students write what they think happened to the dinosaurs. If they finish writing and have extra time they may color the picture. [Independent Practice]

2. Pass out “Dinosaur Notes” worksheets and form students into 6 small groups of 3 or 4 (see Adaptations, otherwise randomly). Pass resource books and article out to the six groups. Mention to the students that the important pages in the book have been paper-clipped to save time. Tell the students to look on these pages to find theories for the extinction of dinosaurs. Have the groups record the theories they find on the “Dinosaur Notes” worksheets. If a group finishes early, have them search for other theories on the Enchanted Learning website. (www.enchantedlearning.com) [Guided Practice]

3. Have a class discussion about the theories found and the information given to support each theory. Tell the students to compare these theories with what they have written on their “Dinosaurs” worksheets about what happened to the dinosaurs. Ask if any of the theories are similar to what they wrote. [Checking for understanding] Write the theories found in the resource books, article, and website on the board numbering them 1 to 6. Add the number 7 and label it “other.”

1. Slow changes in climate, the weather became too cold for the dinosaurs to live (Ice Age)
2. Disease struck the dinosaurs and wiped them out
3. An asteroid hit the earth and clouds of dust blocked the sun for long periods of time (2 months to 2 years), possibly effecting the weather for years afterwards
4. Increased volcanic activity
5. Small mammal-like rats started eating the eggs of the dinosaurs—competition
6. Lowering of the ocean causing the loss of habitat by creating rivers and mountains
7. Other (could be more than one theory combined)

Color code the theories by writing the corresponding color next to the number in the following order:
red=1, orange=2, yellow=3, green=4, blue=5, purple=6, black=7

4. Using the information the class discussed, and the theories listed on the board, have the students choose one of the theories that they think is the best. Pass out the “What Do You Think Happened to The Dinosaurs’ worksheet. Call on volunteers (8 sentences) to read the paragraph at the top of the page. Instruct the students to write the number and the theory they think is best on the lines given. If a student does not want to pick any of the theories given, or if he/she thinks more than one is best, have them write what they believe happened and have them write the number 7 on their paper. [Independent practice] Collect the papers and have 2 student volunteers sort them by number and tally the results next to the theory on the board.

5. Create the outline of a graph on the chart paper with a black marker. Title the graph “Theories for the Extinction of Dinosaurs.” Label the left side of the graph “Number of Students Who Prefer Theory.” Label the bottom of the graph “Theories.” (See example below)
Demonstrate the plotting of theory preference by first stating your choice as “other” and then placing a black square on the chart above number seven. [Modeling] Have students take the colored square of construction paper (with tape on the back) that corresponds to the theory they chose and place it on the graph in the appropriate spot. [Guided practice and checking for understanding]

When graph is complete, have students answer the following questions about it:

2. Which theory had the most supporters?
3. Which theory had the least supporters?
4. Which theories had the same amount of supporters?
5. How many more supporters did 3 have than 6?
   (Continue asking these types of questions based on the results of the students’ graph)
6. Since more students in our class chose theory number 3, does that mean that theory number 3 is more true than the other theories?

[Checking for Understanding]

6. Closure: Say: A theory can never be proven as fact, but through experimentation scientists can find support for their theories. To find out which theory of the extinction of dinosaurs has the most support, scientists study fossils to learn about what the world was like when the dinosaurs lived. Scientists will never know for sure what caused the extinction of the dinosaurs, but they can tell from looking at fossils that millions of species have suffered extinction on earth.

Say: Now lets compare the characteristics of what the world was like when the dinosaurs lived from your journal stories (on side board) with the information that we found in our research to see if we can make any connections. For example, we know from our research of these theories that the climate was warm when the dinosaurs lived. Did anyone talk about a warm climate in their stories? [Modeling and checking for understanding] (Call on volunteers and underline any characteristics that they find are similar)

LESSON FOLLOW-UP

Independent Practice: Have students complete the “Where Did They Go?” worksheet for homework. Go over the directions with students: Read the story and answer the questions below it.

Evaluation:

(a) What did I want students to learn?
   -to develop an understanding of scientific theory
   -to learn about the most popular theories for the extinction of dinosaurs
   -to formulate their own opinion/theory based on what they have learned
   -to plot their own choices of theories on a graph
   -to be able to answer questions based upon the results

(b) How will I know they have learned it?
   -check for understanding on graph plotting and making comparisons
   -class discussions and student participation
   -student responses to questions
   -independent practice worksheets (including homework)
LESSON RESOURCES:

References for student use:


BOCES 2, Department for Exceptional Children. *Explorations in Dinosaurs: Teacher resource packet for the primary grades*. Project ADEPT article “How Did the Dinosaurs Die?” (p37)

References for teacher use:


BOCES 2, Department for Exceptional Children. *Explorations in Dinosaurs: Teacher resource packet for the primary grades*. Project ADEPT. pp 38 and 39 worksheets (“What Do You Think Happened to the Dinosaurs?” and “Where Did They Go?”)

Rothman, R. *Explorations of Dinosaurs with Dr. Bob Rothman*. BOCES 2 Department for Exceptional Children. Project ADEPT. A diversified enrichment program for the talented. (pp 1 and 22 “Dinosaur Notes” and “Dinosaurs”)