

Earth Day Science Symposium

Sea Turtles

Instructions for Pre/Post Question Sets

Introduction

Pre/Post Questions are tools for guiding inquiry and assessing student learning. Students answer the questions before they prepare their EDSS data sets for presentation and again after the activities are completed.

Students are not expected to score high points the first time they answer the questions. As they work with their data sets, they will be practicing the skills needed to improve their answers in the second round.

Contents

Question sets are presented on two-page reproducible handouts (double-sided copies will help save paper). The answer key on pages 2–4 includes very simple rubrics for grading the constructed answer questions. Use one or both of the question sets—the more time you invest, the more students learn and the more opportunities you have for assessment.

Answer Key	2
Question Set 1	5
Question Set 2	7

Scheduling, Time, Materials

Schedule the first round (Pre) a few days in advance of starting the EDSS activity. Plan on 30–40 minutes for each question set. The only materials you'll need are two copies of each question set and a pencil for each student.

New Mexico Science Benchmarks, Grades K–4

Scientific Thinking and Practice, **Standard I, Benchmark I** – Use scientific methods to observe, collect, record, analyze, predict, interpret, and determine reasonableness of data; **Benchmark II** – Use scientific thinking and knowledge and communicate findings; **Benchmark III** – Use mathematical skills and vocabulary to analyze data, understand patterns and relationships, and communicate findings.

Life Science (Understand the properties, structures, and processes of living things and the interdependence of living things and their environments), **Standard II, Benchmark I** – Know that living things have diverse forms, structures, functions, and habitats.

New Mexico Science Benchmarks, Grades 5–8

Scientific Thinking and Practice, **Standard I, Benchmark I** – Use scientific methods to develop questions, design and conduct experiments using appropriate technologies, analyze and evaluate results, make predictions, and communicate findings; **Benchmark III** – Use mathematical ideas, tools, and techniques to understand scientific knowledge.

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Life Science (Understand the properties, structures, and processes of living things and the interdependence of living things and their environments), **Standard II, Benchmark I** – Explain the diverse structures and functions of living things and the complex relationships between living things and their environments.

New Mexico Math Benchmarks, Grades K–8

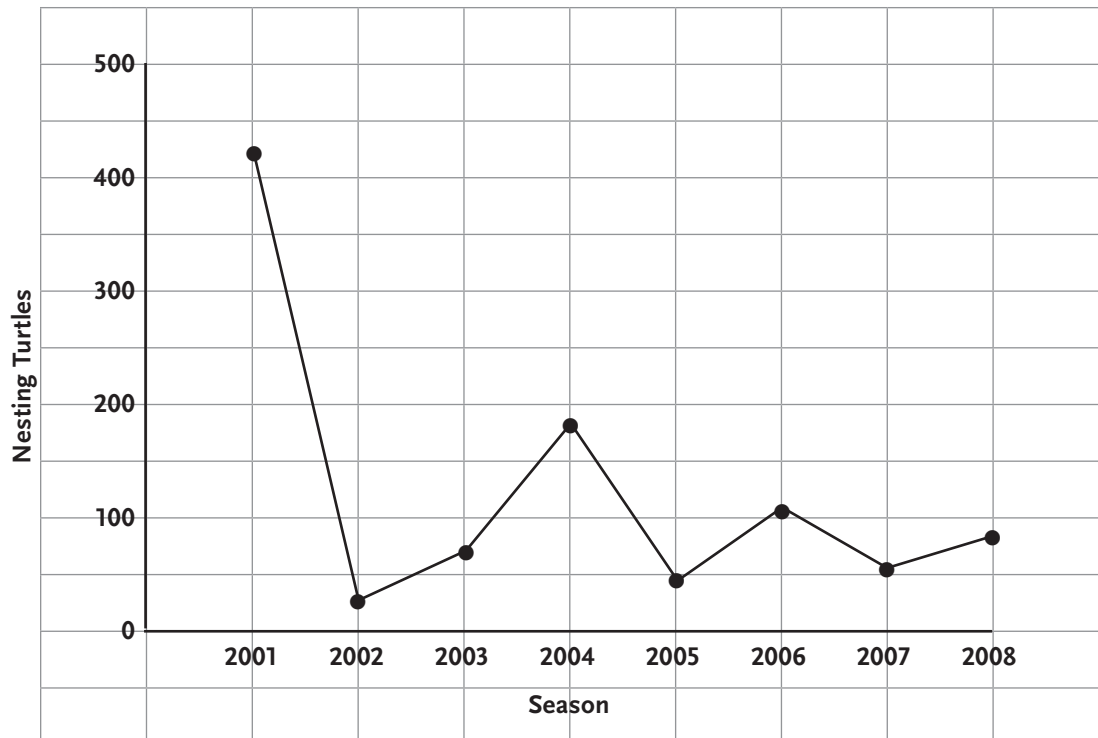
Algebra: **Benchmark A.1** – Understand patterns, relations, and functions; **Benchmark A.3** – Use mathematical models to represent and understand quantitative relationships; **Benchmark A.4** – Analyze change in various contexts.

Data Analysis and Probability: **Benchmark D.1** – Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them; **Benchmark D.2** – Select and use appropriate statistical methods to analyze data; **Benchmark D.3** – Develop and evaluate inferences and predictions that are based on data.

Answer Key

Question Set 1

The total possible score for all four questions is 17. Grade according to your usual scale (multiply the student's total score by 5.88 to convert to a percentage).



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1. The maximum possible score is 3 points, one each for each correctly labeled axis (x and y), one for correctly plotted data points, and one for a line that connects the points. Simplify grading by laying the student's work on the above graph. If data points line up approximately correctly, score the point.
2. The maximum possible score is 1 point. The correct answer is **336**.
3. The maximum possible score is 2 points. The correct answer should include all of the following information: **The number of nesting leatherbacks at Playa Grande is decreasing.** Subtract a point if the information is not written as a complete sentence.
4. The maximum possible score is 3 points. Use the following **rubric** to determine the points earned.

Points	Description
3	The student answers, "No," and gives two or more of the following reasons: (1) The data shown on the graph is for only one beach in Costa Rica (or only one part of the world). (2) The data might be different for other beaches (other parts of the world). (3) There might be leatherback turtles that are not nesting.
2	The student answers, "No," and gives one of the reasons listed above. OR the student answers, "Yes," and explains that the leatherbacks nesting at Playa Grande might include or could represent (in the sense of "be representative of") all of the of the leatherbacks in the world.
1	The student answers, "No," but doesn't give a reason for the answer.
0	The student answers, "Yes," but fails to give a plausible reason for the answer. OR the student gives no answer and no reason.

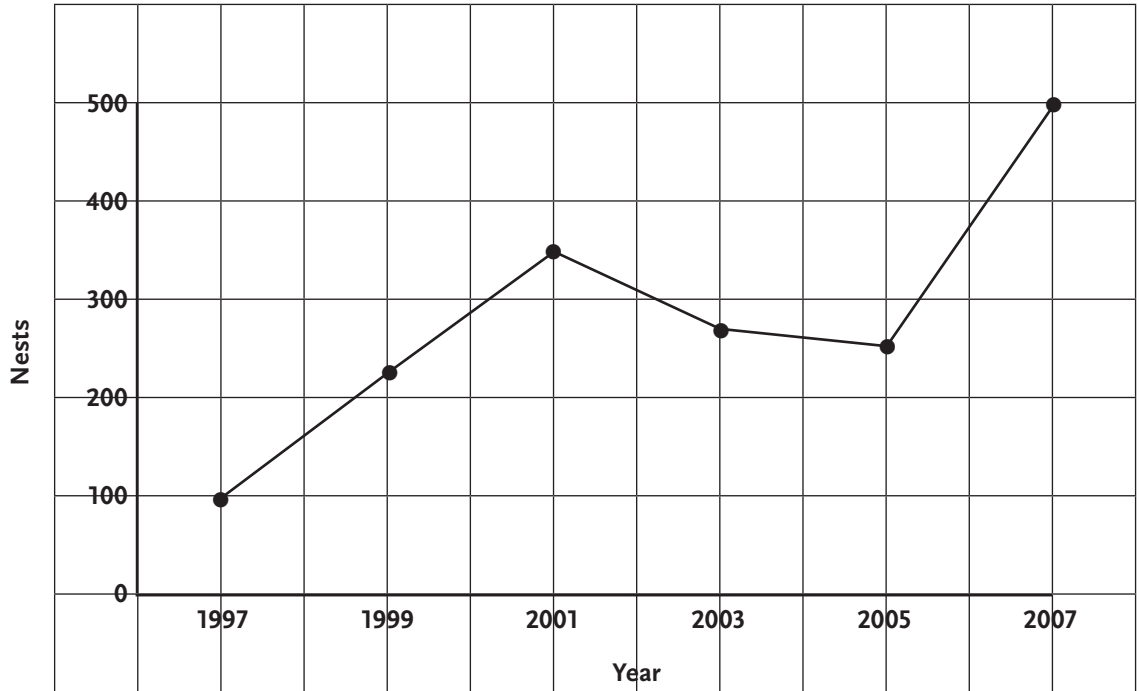
Question Set 2

The total possible score for all three questions is 9. Grade according to your usual scale (multiply student's total score by 11.11 to convert to a percentage).

1. The maximum possible score is 3 points, one for each correctly labeled axis (x and y), one for correctly plotted data points, and one for a line that connects the points. Simplify grading by laying the student's work on the graph below. If data points line up approximately correctly, score the point.

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- The maximum possible score is 3 points. The correct answer is **Yes** (one point) because **in every other year since 1997 the number of nests has been larger than it was in 1996** (one point). **The large increase to 500 nests in 2007 is important** (one point) because it seems to confirm the trend.
- The maximum possible score is 3 points. The correct answer is **No** (one point) for **any two of the following reasons** (one point each).

 - The table doesn't say that nests were counted at all Florida beaches. They could have been counted on other beaches than the one the class is visiting.
 - There could be a lot of nests on some beaches and very few on others.
 - From year to year, the number of nests on any one beach could change from a lot to very few.
 - There is no data for years after 2007, and the numbers could have decreased again by a large amount.

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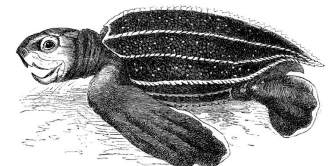
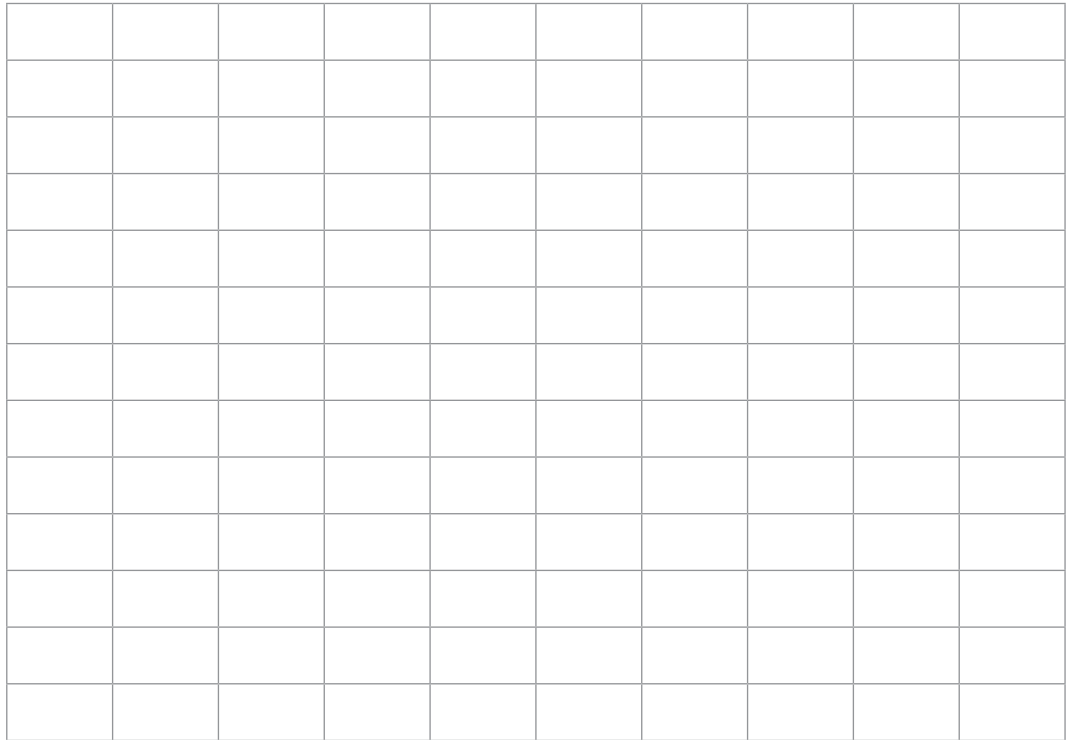
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Ben and Margie are researching leatherback sea turtles. They found the data table below at a turtle conservation website. The data is from the last leatherback nesting beach in the eastern Pacific Ocean.

Nesting Leatherbacks – Playa Grande, Costa Rica

Season	Nesting Turtles	Season	Nesting Turtles
2001	417	2005	48
2002	29	2006	108
2003	68	2007	58
2004	188	2008	81

1. Plot the data on a line graph. Make the graph as complete as possible.



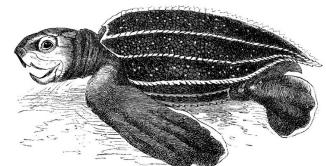
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2. By what amount did the number of nesting leatherback sea turtles change from 2001 to 2008? Write your answer in the box below.

3. A trend is a change that has been happening over a long time and appears likely to continue. The data plotted on the graph shows a trend. What is the trend? Answer with a complete sentence.

4. Based on the graph, Ben and Margie claimed that *the number of leatherback sea turtles in the world is decreasing*. Is it correct to make this claim based only on this graph? Why or why not?



Pre/Post
Questions
2

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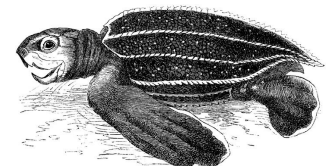
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Maria’s science class was planning a trip to Florida at the time of year when leatherback sea turtles make nests on beaches. Maria asked her teacher if they would see leatherback nests. Her teacher said that there were very few nests when she visited Florida in 1994. She suggested that Maria do some research to find out if there would be more in 2010. Maria went to the library and found the following table.

Leatherback Nests Counted on Florida Beaches, 1996–2007

Year	Nests	Year	Nests
1997	98	2003	280
1999	225	2005	259
2001	357	2007	500

1. Plot this data on a line graph. Make the graph as complete as possible.



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2. A trend is a change that has been happening over a long period and appears likely to continue. Does the graph show a trend? Explain why or why not.

3. Maria's class will go to only one beach in Florida. Does the information in the table tell Maria whether or not she will see leatherback sea turtle nests on the beach she visits?

Yes No

Give two reasons for your answer.

a)

b)

