

Earth Day Science Symposium

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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 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; **Benchmark II** – Know that living things have similarities and differences and that living things change over time.

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

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evaluate results, make predictions, and communicate findings; **Benchmark III** – Use mathematical ideas, tools, and techniques to understand scientific knowledge.

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; **Benchmark II** – Understand how traits are passed from one generation to the next and how species evolve.

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.

For More Information: earthsbirthday.org/nm

Answer Key

Question Set 1

The total possible score for all three questions is 6. Grade according to your usual scale (multiply the student's total score by 16.66 to convert to a percentage).

1. The maximum possible score is 3 points, one for listing years correctly, two for listing numbers of fires correctly, as shown below.

Year	Number of Fires
2003	40,000
2004	55,000
2005	65,000
2006	43,000 *
2007	72,000 *

* Students will have to estimate the numbers of fires in 2006 and 2007. Amounts between 41,000–44,000 and 71,000–73,000 should be counted as correct.

2. The maximum possible score is 1 point. The correct answer is **2006**.

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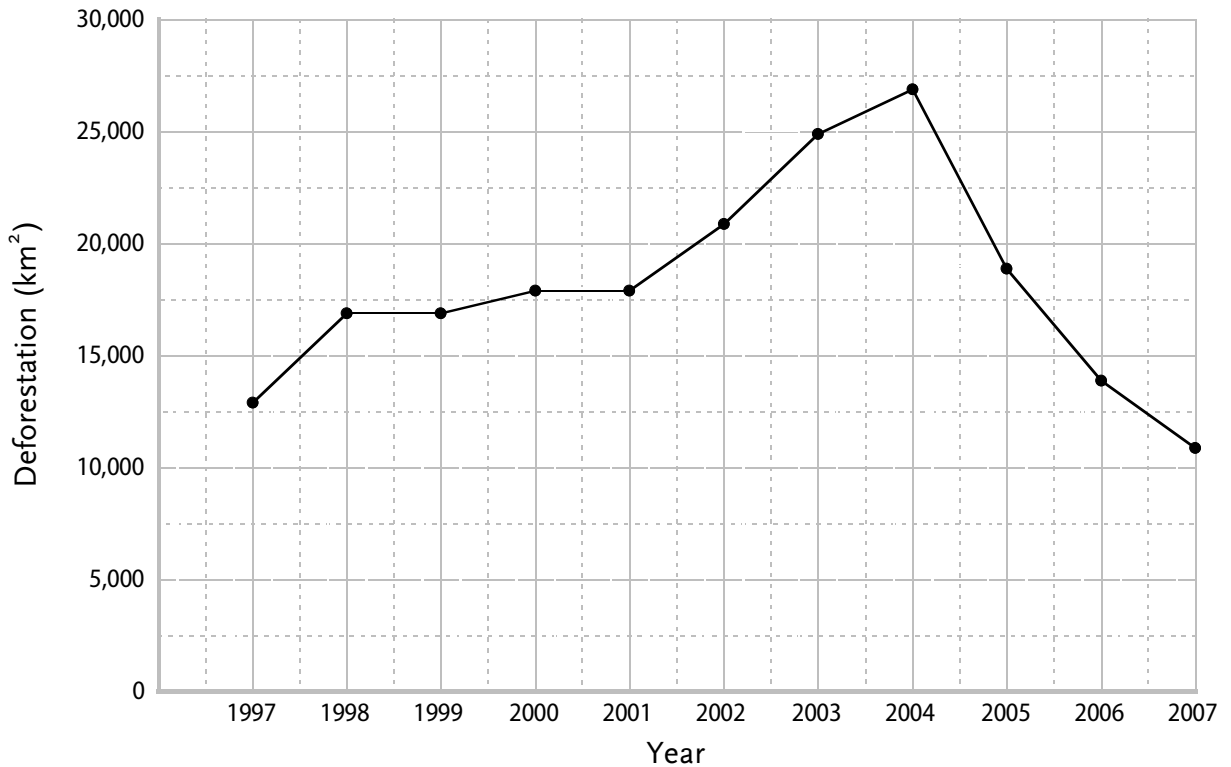
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3. The maximum possible score is 2 points, one each for **any two of the following**:
- Amounts of rainfall in the Brazilian Amazon in the years 2003–2007
 - Forest fires and rainfall in the Brazilian Amazon in more years
 - Forest fires and rainfall in other countries in the years 2003–2007
 - Forest fires and rainfall in other rainforests in other countries in more years
 - The yearly averages of fires and rainfall for many years in many different countries

Question Set 2

The total possible score for both questions is 5. Grade according to your usual scale (multiply student's total score by 20 to convert to a percentage).

1. The maximum possible score is 2 points, one for correctly plotted data points and one for a line that connects the data points. Simplify grading by laying the student's work on the graph below. If the data points and line match approximately, score 2 points.



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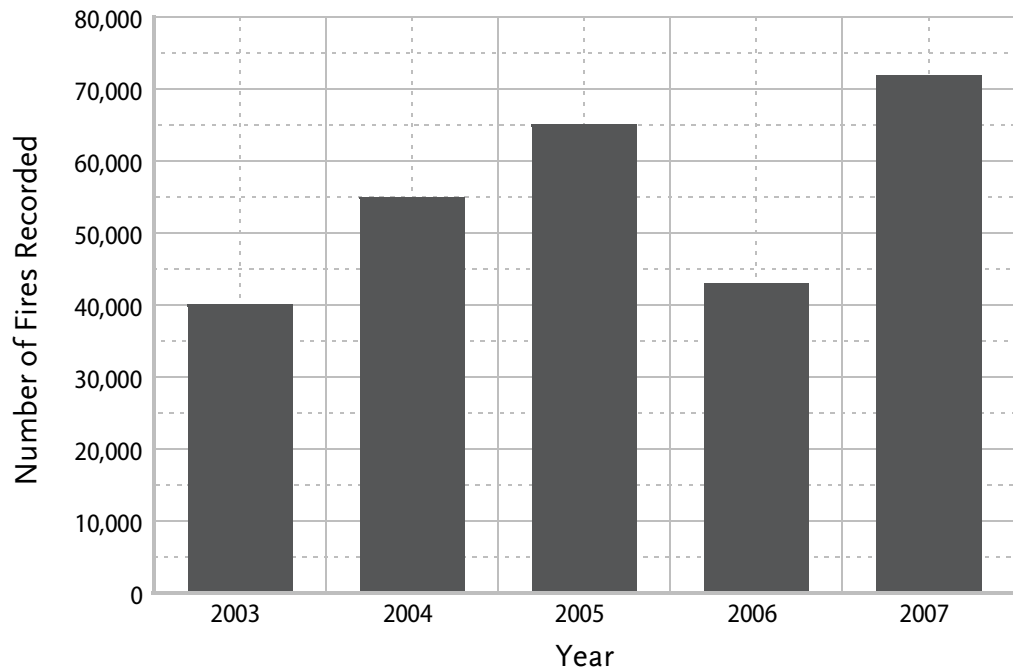
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2. The maximum possible score is 3 points. Use the **rubric** below to determine the points earned.

Points	Description
3	The student answers, "Yes," and explains that the graph shows the amount of deforestation rising a little bit each year for more than eight years, and then decreasing by larger amounts for three years. Something might have happened to cause a change that will continue. OR the student answers, "No," and explains that deforestation rose for eight years. Then it fell for three years, and that isn't long enough to tell whether it will keep falling. The line on the graph could go up again the next year.
2	The student answers, "Yes," and explains that the line goes down a lot in the last three years, and this is enough to make it seem like the change will continue. OR the student answers, "No," and says that the line on the graph could go up or down. There is no way to know (or predict).
1	The student answers "Yes," because the line went down for three years.
0	The student does not explain the answer.

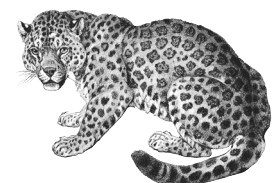
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Amy and John wrote a report on fires in Brazilian rainforests. They included the information shown on this graph.



- Each bar on the graph shows the number of fires in a particular year. Record the years on the table below. Then record the number of fires in each year. Estimate the number if you are not sure.

Year	Number of Fires



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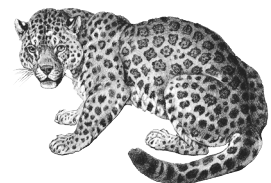
2. Amy wrote that the number of forest fires in the Brazilian Amazon increased in all but one of the years shown on the graph.

In which year did the number of forest fires *not* increase? _____

3. John said that the number of forest fires in rainforests always increases in years when rainfall decreases. Describe two other kinds of data that John and Amy need to help them prove that this is true.

A. _____

B. _____



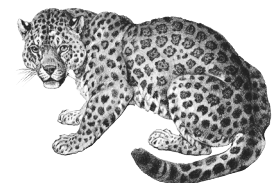
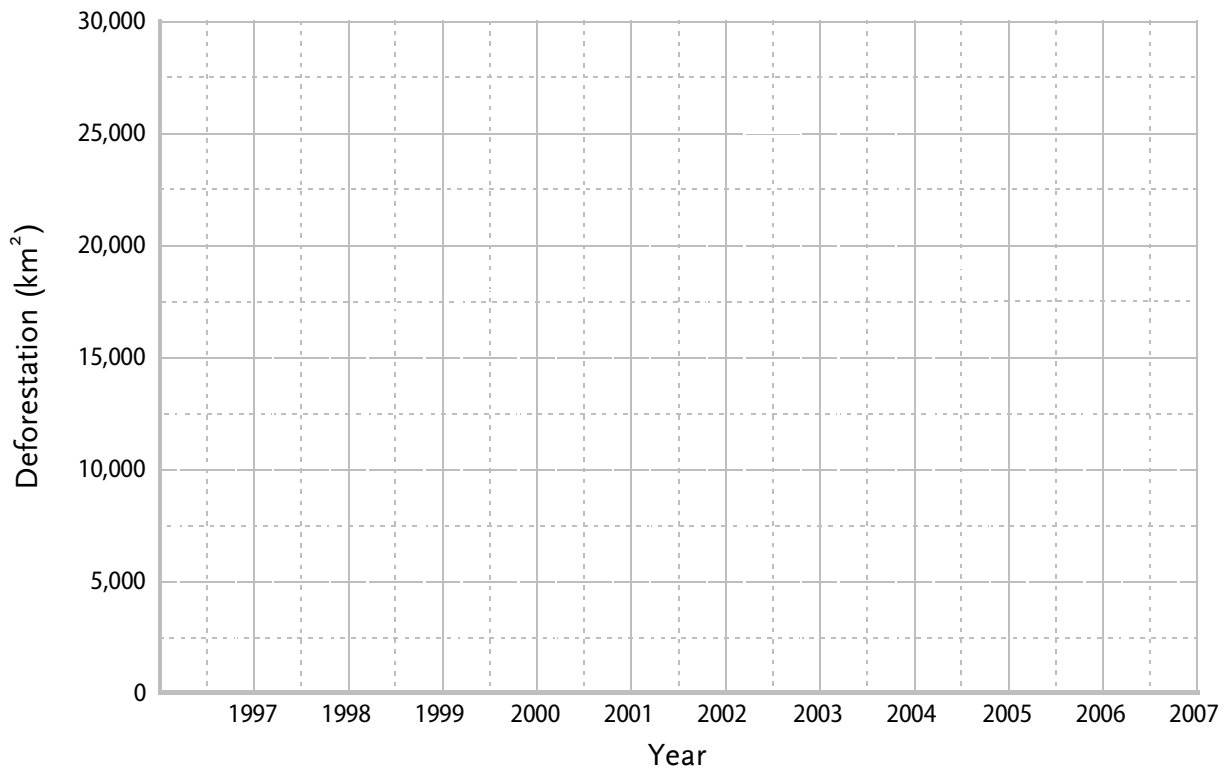
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Tomás and Alicia were looking for information about rainforest destruction when they found this table.

Annual Deforestation in the Amazon, 1997–2007

Year	Deforestation (km ²)	Year	Deforestation (km ²)
1997	13,000	2003	25,000
1998	17,000	2004	27,000
1999	17,000	2005	19,000
2000	18,000	2006	14,000
2001	18,000	2007	11,000
2002	21,000		

1. Plot the data shown on the table on the graph below.



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2. A trend is a change that happens over a long time and seems likely to continue. Tomás and Alicia are unsure whether the graph shows a trend or not. Tomás thinks that deforestation is decreasing. Alicia thinks that there is no trend.

Do you think the graph shows a trend? Explain your answer.

