

# Data Detective Tools

Match each science question to a useful organizer.

**4.1.F** “construct appropriate graphic organizers used to collect data, including tables, bar graphs, line graphs, tree maps, concept maps, Venn diagrams, flow charts or sequence maps, and input-output tables that show cause and effect; and”

NAME \_\_\_\_\_

DATE \_\_\_\_\_

## 1 READ AND MARK \_\_\_\_\_ Read it twice

**YOUR JOB** Underline each graphic organizer named in the passage. Circle the words that tell what each organizer helps a scientist do.

### Choosing a Data Tool

- ① Scientists choose a graphic organizer that fits the question. A table keeps exact facts in rows and columns. A bar graph compares amounts in separate groups, such as the number of ladybugs on different plants. A line graph shows change over time, such as a seedling’s height each week. Clear titles and labels help readers understand the data.

#### BEAN PLANT GROWTH

| Day      | Height, in cm |
|----------|---------------|
| Monday   | 4             |
| Tuesday  | 5             |
| Thursday | 7             |
| Friday   | 8             |

- ② The class measured one bean plant on four school days. Their measurements are listed in the table. The numbers increase as the week goes on. To make a line graph, students would put the days along the bottom and height along the side. Then they would plot each measurement and connect the points.
- ③ Other organizers show relationships. A tree map sorts ideas into groups. A concept map links ideas that belong together. A Venn diagram compares two things, including a shared middle section. A flow chart or sequence map puts steps in order. An input-output table can show a cause as the input and an effect as the output.

2

ANSWER WITH EVIDENCE

Use the passage

- 1

What two kinds of information does each row in the bean plant table show?
- 2

Which organizer would best show how the bean plant’s height changed from Monday to Friday? Explain why.
- 3

A class wants to sort rocks into igneous, sedimentary, and metamorphic groups. Which organizer named in the passage fits this job?
- 4

Rain falls on a dry garden, and the soil becomes wetter. In an input-output table, what belongs in the input and what belongs in the output?

3

YOUR TURN

Your own words

Create an input-output table for a school garden. In three rows, write a cause in the first column and its likely effect in the second column.

| INPUT: CAUSE | OUTPUT: EFFECT |
|--------------|----------------|
|              |                |
|              |                |
|              |                |

**PART 1 • READ AND MARK**

Underline each graphic organizer named in the passage. Circle the words that tell what each organizer helps a scientist do. Accept any marking that follows this job and points at the right text.

**PART 2 • ANSWERS**

| # | QUESTION                                                                                                                                     | ANSWER                                                                       |
|---|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| 1 | What two kinds of information does each row in the bean plant table show?                                                                    | <b>Each row shows a day and the bean plant's height in centimeters.</b>      |
| 2 | Which organizer would best show how the bean plant's height changed from Monday to Friday? Explain why.                                      | <b>A line graph. It shows how data changes over time.</b>                    |
| 3 | A class wants to sort rocks into igneous, sedimentary, and metamorphic groups. Which organizer named in the passage fits this job?           | <b>A tree map.</b>                                                           |
| 4 | Rain falls on a dry garden, and the soil becomes wetter. In an input-output table, what belongs in the input and what belongs in the output? | <b>Input: rain falls on the dry garden. Output: the soil becomes wetter.</b> |

**PART 3 • YOUR TURN (SAMPLE ANSWER)**

| INPUT: CAUSE                                   | OUTPUT: EFFECT                        |
|------------------------------------------------|---------------------------------------|
| A student waters dry soil.                     | The soil becomes wetter.              |
| A plant is placed where it gets more sunlight. | The plant receives more light energy. |
| A caterpillar eats bean leaves.                | The plant has fewer leaves.           |

Accept scientifically reasonable wording. For Question 2, students should identify a line graph and explain that it shows change over time, and for Question 4, the input must be the cause and the output must be the result.