Direct and Indirect Observations
Objectives

- Use a model to explain indirect observation.
- Develop and test hypotheses.
- Observe and record observations.
- Compare direct and indirect observations.
Vocabulary

- **Observation** – a statement or comment based on something one has seen, heard, or noticed
  - **Direct** – looking at the actual behavior/occurrence; the researcher is the observer
  - **Indirect** – the result of an occurrence that cannot be directly viewed in which the research infers what happened to cause the occurrence

- **Perception** – a particular attitude toward or way of regarding something; a point of view
Habit of the Mind

- Gathering Data Through All Senses
Titan Creed

- Titans take ownership of and find joy in learning.
Key Question to Ponder

If two people are observing the same thing at the exact same moment, can their observations differ?
What is Perception?
- a point of view
Picture #1

Are the lines the same or different?
RABBIT OR DUCK?
Picture #3

FACE OR PERSON?
Picture #4

OLD WOMAN OR YOUNG LADY?
Key Question

If two people are observing the same thing at the exact same moment, can their observations differ?
Awareness Test
Observations in Nature
Key Idea

Compare indirect and direct observations.
Objectives

- Use a model to explain indirect observation.
- Develop and test hypotheses.
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Activity: Ob-Scertainier

**PROBLEM:** What is the configuration or design inside the closed container known as an OB-SCERTAINER™?

**KNOWN DATA:** The closed OB-SCERTAINERS™ have a steel ball inside that moves within the partitions and walls (up to 5). You are unable to see or touch the inside of the OB-SCERTAINER™.
Activity: Ob-Scертainer

PROCEDURE:
1. Shake and tilt your OB-SCERTAINER™.
   - Shake gently. The partitions are fragile and can break.
2. Determine the shape and location of the partition or partitions from the sound and path of the steel ball.
3. Record the OB-SCERTAINER™ number in the blank below and draw a hypothesis in the first circle.
4. Test this hypothesis by moving the ball along the partitions according to the hypothesis.
   - Make revisions (if needed) to the hypothesis or create a new one in the second circle. This will reflect your final hypothesis.
   - As you complete this, you are creating a model to explain the phenomenon you are observing. Save the third circle to fill in the actual configurations.
5. Continue testing three more OB-SCERTAINERS™.
   - Some of them may be more difficult than others, but do not spend more than 5 minutes on each.
   - DO NOT OPEN THE OB-SCERTAINERS™.
<table>
<thead>
<tr>
<th>Ob-Scertain #</th>
<th>Hypothesis</th>
<th>Retest</th>
<th>Actual Model</th>
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Observations Comparison

- **Compare Definition**: to examine (two or more objects, ideas, etc.) in order to note similarities and differences

- Compare direct and indirect observations.
Real-World Application
Graphical Analysis

Figure E: How statistics can be misleading
Titan Creed

- Titans take ownership of and find joy in learning.