

Lesson 01: Which One Doesn't Belong (Low-Inquiry Version)

Lesson Title: Which One Doesn't Belong - Identifying the Outlier

Intended Grade Level(s): Grades 6-12 (adaptable)

I. Planning

Lesson Focus / Goals

The lesson aims to provide the following for students: - Practice forming hypotheses/conjectures - Learn to justify their conjectures using evidence from observable properties - Understand that reasoning requires both claims (hypotheses) and justification (evidence)

Learning Objectives

By the end of the lesson, students will be able to: - Form a hypothesis about which item doesn't belong based on the criterion provided by the teacher - Justify their hypothesis using the specific properties the teacher identifies - Use correct terminology (hypothesis, conjecture, justification, evidence) when explaining their reasoning

Standards Alignment

Standards for Mathematical Practice (Common Core): - **MP3** – Construct viable arguments and critique the reasoning of others. - **MP6** – Attend to precision.

NGSS Science and Engineering Practices: - **Analyzing and Interpreting Data** – Students identify patterns and relationships among visual elements. - **Engaging in Argument from Evidence** – Students justify claims about similarities and differences using observable properties.

II. Implementation

Materials Needed

The following materials are used in the lesson: - **Projector/screen** to display the four images - **Teacher answer key** with one pre-selected answer and explanation for each slide - **Student worksheet** with spaces to record the teacher's explanation - **Whiteboard/markers** to demonstrate the correct thinking process

Preparation: Teacher prepares 5 different “Which One Doesn’t Belong” slides. For each set, teacher has identified one valid justification to share with students (though aware other justifications exist).

Lesson Flow

Before: (Launch – 5 min)

1. Show **Slide 1** with four shapes.
2. Ask: “Which one doesn’t belong?”
3. Wait briefly for a few student responses, then share: “Today I’m going to show you one way to think about each set. The circle doesn’t belong because it’s the only one without straight edges.”
4. Explain: “Today we’ll practice identifying which item doesn’t belong and explaining why using specific properties.”
5. Model thinking process: “When I look at these, I ask myself: What makes one different from all the others? I’ve picked out one strong justification for each set we’ll look at today.”

During: (Explore – 15 min)

- Teacher shows **Slides 2-5**, one at a time
- For each slide:
 - Students look at the four items individually (30 seconds think time)
 - Teacher asks: “Which one do you think doesn’t belong?”
 - A few students volunteer answers
 - Teacher selects one answer to feature: “I like that thinking. Today I want to focus on this one because...”
 - Teacher explains the key property that makes that item different
 - Students write down the property on their worksheet
- Teacher circulates to ensure students are copying the explanations correctly
- If students suggest alternative answers, teacher acknowledges: “That’s an interesting observation. For today’s lesson, let’s focus on the one I’ve prepared.”

After: (Discuss – 5 min)

- Review all five slides
- Ask: “What did we learn about identifying outliers?”
- Emphasize: “The key is to look for a property that makes one item different from the others.”
- Remind students: “When you explain, use specific vocabulary like we did today.”
- *Note: Teacher acknowledges if asked that other answers could work, but emphasizes the importance of following the model provided.*

III. Assessment

Formative Assessment

Formative: During the lesson, check if students: - Are following along with the teacher's selected justification for each set - Are copying the explanations accurately onto their worksheets - Are using the vocabulary the teacher modeled

Exit Ticket: Students complete one final "Which One Doesn't Belong" problem. They must select from three provided answers (A, B, or C) and copy the corresponding explanation from the board.

Peer/Self-Assessment: Students check their neighbor's worksheet to ensure they recorded all five explanations correctly.

Note: Please attach student handouts and any other printed materials (e.g., readings) that students will need to complete the lesson.

Student Worksheet

Name: _____ **Date:** _____

Which One Doesn't Belong - Recording Sheet

For each set of images, write down which one doesn't belong and WHY (use the explanation your teacher provides).

Slide 1:

Doesn't belong: _____

Why: _____

Slide 2:

Doesn't belong: _____

Why: _____

Slide 3:

Doesn't belong: _____

Why: _____

Slide 4:

Doesn't belong: _____

Why: _____

Slide 5:

Doesn't belong: _____

Why: _____

Exit Ticket:

Look at the four items below. Which one doesn't belong?

Choose the correct answer: - ☐ A. Top left - ☐ B. Top right
- ☐ C. Bottom left - ☐ D. Bottom right

Copy the explanation from the board:
