

Predict, Observe, Explain (POE)

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Chris Joyce (2006)

The POE strategy was developed by White and Gunstone (1992) to uncover individual students' predictions, and their reasons for making these, about a specific event.

Reference: White, R. T., & Gunstone, R. F. (1992). *Probing Understanding*. Great Britain: Falmer Press.

When to use

POE is a strategy often used in science. It works best with demonstrations that allow immediate observations, and suits Physical and Material World contexts. A similar strategy also works well in mathematics, particularly in statistics.

- It can be used for:
 - finding out students' initial ideas;
- providing teachers with information about students' thinking;
- generating discussion;
- motivating students to want to explore the concept;
- generating investigations.

The theory

Constructivist theories of learning consider that students' existing understandings should be considered when developing teaching and learning programmes. Events that surprise create conditions where students may be ready to start re-examining their personal theories.

How the strategy works

- Unless students are asked to predict first what will happen, they may not observe carefully.
- Writing down their prediction motivates them to want to know the answer.
- Asking students to explain the reasons for their predictions gives the teacher indications of their theories. This can be useful for uncovering misconceptions or developing understandings they have. It can provide information for making decisions about the subsequent learning.
- Explaining and evaluating their predictions and listening to others' predictions helps students to begin evaluating their own learning and constructing new meanings.

What to do

- Set up a demonstration of an event, related to the focus topic, that may surprise students, and which can be observed.
- Tell the students what you are going to be doing.

Step 1: Predict

- Ask the students to independently write their prediction of what will happen.
- Ask them what they think they will see and why they think this.

Step 2: Observe

- Carry out the demonstration.
- Allow time to focus on observation.

- Ask students to write down what they do observe.

Step 3: Explain

- Ask students to amend or add to their explanation to take account of the observation.
- After students have committed their explanations to paper, discuss their ideas together.

To generate your own POEs

Books that contain science “experiments” are often a good source of appropriate activities for adapting to POE, including old teaching resources that promote transmission teaching. They often include an explanation.

A template is provided for teachers to give to students to write on. To adapt the template, save in your own files, and make appropriate changes.

Limitations

- For primary school students, writing the answer can be a barrier to useful communication of ideas. Oral responses need to be managed so other group members do not initially influence students. (Use Think-Pair-Share, for example, before sharing with the whole group.)
- Younger primary students may have difficulty explaining their reasoning.
- It is not suitable for all topics, for example, topics that are not “hands-on” or in which it is difficult to get immediate results (for example, Living World).
- If the POE strategy is used often, some demonstrations should be chosen to not give surprising results, otherwise students start looking for the trick. This may affect the explanations they give.
- Some researchers say that students are more likely to learn from observations that confirm their predictions. This cautions us to be careful that predictions are not wild guesses. A joint conversation about what we might expect to see, and why, based on the underlying science idea, could help avoid this trap.

References:

- Palmer, D. (1995). The POE in the primary school: An evaluation. *Research in Science Education*, 25 (3), 323-332.
- Hipkins, R., & Kenneally, N. (2003). *Using NEMP to inform the teaching of scientific skills*. (Pages 50-51).

Adapting the strategy

- Rather than the teacher demonstrating to the whole class, small groups can carry out the activity themselves. It is more difficult for the teacher to monitor the discussion, but does allow for students to observe more closely.
- With some students it may be more appropriate to ask for oral responses, for example, young or ESOL students.
- If the students are unfamiliar with the underlying concept, or are very young, provide options from which they can choose.
- In mathematics the students investigate, rather than observe.

Examples of ARB resources that use the POE strategy [login required]

Name: _____

Description of focus of demonstration

(e.g., What will happen when you put an upside down jar over a lighted candle?)

Predict

Write or draw all the things you think you will see.

Explain

Write the reasons why you think it will happen this way.

Observe

Draw or describe what you did see.

Explain

Add to or change your ideas about why it happened.

Resource List

- Two dice game I
- Balloons
- Throwing balloons - investigation
- Sliding, spinning, tumbling