

## Lesson Plan on Writing a Method

### Objective:

- Students will learn what is included in the Methods section of a scientific paper.
- Students will be able to write their own Method for their own experimental design.
- Students will be able to recognize errors and flaws in their current experimental design and be able to make the proper adjustment in their method.

### Standard(s):

#### Investigation and Experimentation

- 1. Scientific progress is made by asking meaningful questions and conducting careful investigations
- 1a. Select and use appropriate tools and technology
- 1b. Identify and communicate sources of unavoidable experimental error
- 1d. Formulate explanations by using logic and evidence
- 1f. Distinguish between hypothesis and theory as scientific terms
- 1j. Recognize the issues of statistical variability and the need for controlled tests

### Academic Language Considerations:

Vocabulary: Variable, Control, Quantitative Data, Qualitative Data, Statistically analysis

#### Non-Vocabulary:

- Determine a Control and Variable in your experiment
  - Students can mistake a control for it's common use meaning to exercise restraint over. It is important to make the distinction between the common term and a scientific control
- Make sure to include qualitative data
  - Students may misinterpret qualitative to mean the quality or accuracy of the data.

### Materials:

- PowerPoint presentation on Writing a Method
- Writing Your Methods Section Handout
- Computers for each student

**Instructional Breakdown:**

|                        | <b>Time Interval</b> | <b>Teacher Action</b>  | <b>Student Action</b>   |
|------------------------|----------------------|--|---|
| <b>Warm-Up</b>         | 10 min               | <ul style="list-style-type: none"> <li>• Take out your notes on the Process of Science and Designing Your Experiment and students brainstorm.</li> <li>• After reading a description of what is included in a Methods section, on a separate piece of paper, brainstorm what will go in your Methods section.</li> </ul>   | <ul style="list-style-type: none"> <li>• Students take out their Notes on the Process of Science and Designing the Experiment.</li> <li>• Students read the slide that explains what goes in a Methods section</li> <li>• On a separate piece of paper, students brainstorm what types of things will go in their own Methods section.</li> </ul> |
| <b>Method Revision</b> | 50 min               | <ul style="list-style-type: none"> <li>• Have students share out their ideas</li> <li>• Use PowerPoint and handout, Writing Your Methods Section, to explain what should be check list of items needed in methods. Explain that the sentence starters are there to help you organize your ideas.</li> <li>• Sit with each group to make sure they include everything on the checklist.               <ul style="list-style-type: none"> <li>○ Organisms used and how</li> <li>○ Training the bees</li> <li>○ Experimental set up and duration</li> <li>○ Variable and Control</li> <li>○ How data will be collected</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Students share out their brainstorm</li> <li>• Students work in their bee experiment groups and write their methods.</li> </ul>  |

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|------------------------|--------|--|---|
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