



# LEARNING MODULES

GK-12 DISSECT at New Mexico State University

**Title:** Guess My Number Sequence

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**Discipline or Area:** Computer Science

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**School:** Centennial

**Subject of class:** Computer Science

**Grade:** 10

## **COVERAGE OF COMPUTATIONAL TOPICS**

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Algorithms

## **OBJECTIVES**

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Provide the students with an example of the falsifiability of a scientific hypothesis.

## **EQUIPMENT AND MATERIALS**

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Place to write numbers that students guess for the entire class to see.

## **BACKGROUND AND REFERENCES**

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The module tries to introduce the scientific method of trying to disprove a hypothesis instead of trying to confirm a previous guess. People are predisposed to finding a pattern and will tend to propose a question to prove the hypothesis correct. While in science a fundamental idea is that nothing can be proven true, only false.

## **PROCEDURE**

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1. Create several teams for the students to be in.
2. Write down a general rule for creating a sequence of numbers (e.g. increasing numbers, 3 numbers under 100, etc.) but keep it hidden.
3. Provide the students with a sample sequence of numbers that follows the rule and also some other obvious rule such as “add 1 to the previous number”.
4. Ask a group to propose a new sequence of numbers.
5. Answer if the sequence follows your hidden rule.
6. Ask the group to propose what the hidden rule is.
7. Continue with the groups until a group successfully finds the hidden rule or several rounds have passed with no progress.

After the hidden rule is revealed, then discuss with the class about which guesses revealed the most information about the rule. It should be the ones that did not follow the rule which give information about what the rule is.

The goal is to have the students think about a way to find hidden information by trying to disprove what they believe to be correct.

A way to assess the effectiveness of the module is to count how many guesses it takes for the students to find the hidden information.

## **NOTES AND OBSERVATIONS**

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Both classes I presented the module were able to correctly find the hidden rule. My expectation was that it would not be found.

The module was presented as a competition to encourage the participation of the groups. I still noted that only one or two people in each group would propose the guesses.