



Elementary School Activity
Scientific Method: The Game!
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Preparation and Background:

Introduce the students to the game Mastermind®¹ about a week or so before your presentation to give them an opportunity to learn the winning strategy. By playing the game, the students will be learning the scientific method without even realizing it

What's Needed:

This activity makes use of a board game called Mastermind®. Shareware computer versions are available on the web; the computer versions will allow students to play the game on their own at home. Alternatively, you can reproduce the game using 'chads' punched out of coloured paper.

Windows 95/98/ME/2000:

<http://download.cnet.com/downloads/0-10040-100-3681413.html?tag=st.dl.10040.unav.0>

Mac OS (9.0 or higher):

<http://www.macgamefiles.com/detail.taf?item=16996>

What To Do:

Define the scientific method and essential terms: hypothesis, predictions, experiment, data, and truth. More advanced students may be able to understand terms such as induction, deduction and replication. Use the strategy of the game to illustrate these concepts. For younger students it may help to work through a game as you do this.

At the beginning of the game, the computer (or a human partner) will select a sequence of (usually 4) colours. The objective of the game is to determine this sequence within a maximum number of attempts. After each guess the students receive information from the computer (or partner) about the accuracy of their guess: do the colours appear in the sequence at all, and are they in the right order? Students should learn quickly that they need to make guesses that will provide them with clearly interpretable information. They will then have to: (i) interpret the data they have available, (ii) create alternatives regarding what the data is telling them, and (iii) structure their next guess in a way that will eliminate one or more of these alternatives.

After the students are proficient at winning, discuss the objective of science, i.e. to learn the unknown as efficiently and rigorously as possible. Tell them they have been doing exactly what scientists do while playing Mastermind®.

What's Happening:

The sequence they are trying to guess represents the 'truth'. Each guess is an 'experiment' which provides them with 'data'. The particular sequence of colours they use in each experiment is a prediction of a hypothesis they created based on the data gathered from previous experiments. They should have an expectation of what data they will receive if the hypothesis is correct or not.

¹ Mastermind is a registered trademark of Pressman Toy Corporation, by arrangement with Invicta Toys and Games, Ltd., UK.