

Name:

Scientific Method

TEACHER NOTES

1. Name the steps in the scientific method

- OBSERVING & Defining a Problem
- Form Hypothesis
- Design Experiment
- Do Experiment / Collect Data
- Form Conclusion
- Verify Results
- Share results

2. Scientists use their Senses to make observations.

3. Explain a scientist's first step in the scientific method.

A scientist notices something
in the natural world.

- eg. Black clouds
- ④ Give an example of an observation that a scientist might make.
Salamanders have curved, not straight,
tails near a pond

5. What is a hypothesis?

AN EDUCATED GUESS that suggests a solution
to the problem

6. A hypothesis must be testable and it must Predict
an outcome.

7. Some hypotheses are written as IF - then statements.
Predictions.

8. Write a hypothesis for the observation you wrote in question ⁴2.

SALAMANDERS HAVE curved tails
due to pollutants in moist soil.

9. What is an experiment?

A procedure to test the hypothesis.

10. In a scientific experiment, what is a variable?

a factor in the experiment that
controls the outcome of the
EXPERIMENT

11. What is the difference between a control variable and an experimental variable?

CONTROL - FACTOR(S) THAT YOU DO NOT CHANGE

EXPERIMENTAL - THE ONE FACTOR YOU DO
CHANGE.

12. How many experimental variables should there be in a good experiment?

ONE!

13. An experimenter changes ONE factor and then MEASURES

OR ~~and~~ observes what happens.

14. Other factors in an experiment must be kept CONSTANT so
they won't affect the OUTCOME.

15. What is the purpose of having a control in an experiment?

TO GIVE Base-line DATA
for the purpose of comparison.

16. What is an independent variable? the EXPERIMENTAL VARIABLE

17. What is a dependent variable? the FACTOR THAT IS MEASURED/OBSERVED as a result of MANIPULATING the indep. Variable

18. In the experiment to find the fastest route to school, what serves as:

a. the independent variable? the Route

b. the dependent variable? time

c. the control variable? Keep the SAME WALKER
~~(PERHAPS USE A CAR)~~

21. Name the two groups needed to have a valid experiment.

a. Control Group

b. Experimental Group.

22. When there is more than one experimental group, what must be done to maintain a valid experiment? HAVE ONE EXPERIMENTAL VARIABLE / group

23. In order for an experiment to be valid, there must be several trials or Specimen in each group.

24. What is data? — Results of the experiment
— observations about the dependent variable

25. What are the two types of data, and what is the difference between them?

Quantitative - observations that are measured (mass, volume, etc)
Qualitative - descriptive observations (colour, taste)

26. To be useful, collected data must be organized

27. Name 3 ways of organizing data.

- a. charts
- b. tables
- c. graphs

28. What is the conclusion of an experiment?

States whether hypothesis is supported or not. (Based on data).

29. What must be done to verify the results of an experiment?

Experiment must be retested.

30. What are three reasons for sharing the results of an experiment?

- a. To benefit everyone
- b. Source of info when researching a new experiment
- c. Allows other scientists to redo & validate the results, or identify errors