Name:..... Class:.....

Prescribed Focus Area: 4.2
uses examples to illustrate how models, theories and laws contribute to an Understanding of phenomena

Making Inferences & Predictions

Inferences-	Predictions-
Once an observation is made, scientists will try and explain it. This explanation is an inference. Inferences are used in conjunction with previous knowledge, to put forward a hypothesis from the observations made.	Predictions are used to design an experiment from the hypothesis. A prediction should be simple, specific and able to be tested.

An Example of Using Inferences and Predictions in Scientific Method:

The above example is a very simplified description

The Problem:
Important trees in a wetlands area are dying. The trees are an integral part of the wetlands environment.

Observations:
* Trees in wetlands area are dying;
* The amount of dissolved salt in wetlands has increased over the previous few years.

Inference:
The increased salt level may be affecting trees.

Hypothesis:
"The increase in dissolved salt in wetlands is causing the trees to die."

Prediction:
Young trees grown in conditions where salt levels match that of the wetlands should also die.

Experiment:
A large number of young trees are grown in conditions where:
* salt levels are similar to the levels previously found in wetlands (before trees were dying);
* salt levels are similar to the present levels in wetlands.

of the whole process. The experiment itself may be unsuitable to test the hypothesis because young trees may not be affected by the increased salt levels as much as the mature older trees.
The whole process of scientific method is a very precise and involved process which requires much dedication and skill!

When testing a hypothesis, scientists often design experiments so that they consist of:
1. **The control experiment-** this is a test under normal conditions.
2. **The test experiment-** this part of the experiment examines the effect of the particular factor being tested.

It is also important that other factors not being tested (**called variables**) are kept constant.

Summarising Inferences & Predictions in Scientific Method

Observations

Inferences-
An inference is a statement which explains an observation or observations ~ it might or might not be correct.

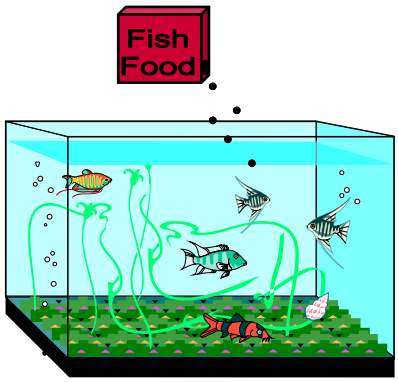
Hypothesis

Predictions-
A prediction is a forecast of what a future observation will be, based on past observations. Predicting is used to help design an experiment from a hypothesis. A prediction should be able to be tested.

Experiment

Questions: **(answers for Q1-6 are on Nature & Practice of Science 1 sheet)**

1. What is science often described as?
2. What is scientific method?
3. (a) What is the first main step in scientific method?; (b) How is an observation made?
4. (a) What is the second main step in scientific method?; (b) What is a hypothesis?; (c) How is a hypothesis tested?;
   (d) What happens if the results show the hypothesis to be correct?;
   (e) What happens if the results show the hypothesis to be incorrect?
5. What is the last main step in scientific method if the hypothesis is correct?
6. What does scientific method lead to?
7. (a) What is an inference?; (b) What are inferences used for in scientific method?
8. (a) What is a prediction?; (b) What are predictions used for in scientific method?;
   (c) What should you be able to do with a prediction?
9. Indicate whether the following are observations, inferences or predictions:
   (a) the grass is green; (b) it may rain this afternoon;
   (c) the car probably stopped because it has run out of petrol;
   (d) that dog must be friendly, it is wagging its tail;
   (e) the water has a temperature of 65^{o}C;
   (f) the school bell will ring at 3.15 PM.
10. A scientist wishes to find out whether a particular vitamin will improve the colour of goldfish.
    (a) Design an experiment which could be used to test this;
    (b) How would be the control experiment be carried out?;
    (c) What are some of the variables which would have to be kept constant?



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