Ch. 1 – Intro to Science Notes

1) The Nature of Science

Science - is _____ , _____ and

_____ to find the nature of things.

2) Model

A MODEL is a _____ of an object or event.

Ex: drawings, _____ , a set of
rules, _____ , computer pictures

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3) The _____ involves a

series of steps that are used to investigate a

_____ .

4) We shall take a closer look at these steps and the terminology you will need to understand before you start a science project.

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5) Scientific Method

1) _____
2) Collect Data
3) _____
4) _____ - only on variable!!! All other conditions controlled (never change)!!!
5) Conclusion

6) Observations

John watches his grandmother bake bread. He ask his grandmother what makes the bread rise.
She explains that yeast releases a gas as it feeds on sugar.

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7) Problem/Question

John wonders if the amount of sugar used in the recipe will affect the size of the bread loaf?

8) Collect Data

John researches the areas of baking and fermentation and tries to come up with a way to test his question. He keeps all of his information on this topic in a journal.

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9) Formulate a Hypothesis

After talking with his teacher and conducting further research, he comes up with a hypothesis.

Hypothesis: "If more sugar is added, then the bread will rise higher."

10) Hypothesis

The hypothesis is an educated guess about the relationship between the independent and dependent variables.

Note: These variables will be defined in the next few slides.

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11) Independent Variable

The _____ , or manipulated variable,

is a factor that's _____ varied by the

experimenter.

John is going to use 25g., 50g., 100g., 250g., 500g. of sugar in his experiment.

12) Dependent Variable

The _____ , or responding variable, is

the factor that may _____ as a result of changes

made in the _____ variable.

In this case, it would be the size of the loaf of bread.

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13) Experiment

His teacher helps him come up with a _____

and list of needed _____ .

She discusses with John how to determine the _____

_____ .

14) Control Group

In a scientific experiment, the _____ is

the group that serves as the standard of _____ .

The control group may be a "_____ "

or an "experimenter selected" group.

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15) Control Group

The control group is exposed to the_____

conditions as the experimental group,_____ for

the_____ being_____ .

All experiments should have a control group.

16) Control Group

Because his grandmother always used 50g. of sugar in her recipe, John is going to use that amount in his control group.

17) Constants

John's teacher reminds him to keep _____

_____the same so that any observed

changes in the bread can be attributed to the variation

in the amount of sugar.

18) Constants

The _____ in an experiment are all the

factors that the experimenter attempts to _____

_____ .

19) Constants

They might include:
Other ingredients to the bread recipe, oven used, rise time, brand of ingredients, cooking time, type of pan used, air temperature and humidity where the bread was rising, oven temperature, age of the yeast…

20) Experiment

John writes out his procedure for his experiment along with a materials list in his journal. He has both of these checked by his teacher where she checks for any safety concerns.

21) Trials

Trials refer to_____ groups that are

exposed to the same conditions in an experiment.

 -John is going to test each sugar variable 3 times.

Size of Baked Bread (LxWxH) cm^3 Trials			
Amt. of Sugar (g.)	1	2	3	Average Size (cm^3)
25	768	744	761	758
50 Control Group	1296	1188	1296	1260
100	1188	1080	100	1116
250	672	576	588	612
500	432	504	360	432

22) Collect and Analyze Results

John examines his data and notices that his control worked the best in this experiment, but not significantly better than 100g. of sugar.

23) Conclusion

John examines his data and notices that his control worked the best in this experiment, but not significantly better than 100g. of sugar.

24) Experiment

Once again, John gathers his materials and carries out his experiment. Here are the results.

Size of Baked Bread (LxWxH) cm^3 Trials			
Amt. of Sugar (g.)	1	2	3	Average Size (cm^3)
50 Control Group	1296	1440	1296	1344
60	1404	1296	1440	1380
70	1638	1638	1560	1612
80	1404	1296	1296	1332
90	1080	1200	972	1084

25) Conclusion

John finds that 70g. of sugar produces the largest loaf.
His hypothesis is accepted.