Review – Variables, Hypotheses, Criteria and Constraints

Name: _____ Date: _____ Core: _____

LT1: I can identify and explain three different types of experimental variables.
LT2: I can write a formal hypothesis.
LT3: I can identify and describe criteria and constraints for engineering projects.

Part 1: Variables – IV, DV, CV

Directions: Watch the Video clip: *Scientific Variables* and answer the following questions.

1. An **independent variable (IV)** is _____
2. What was the independent variable in Mr. Koning's plant experiment?

   _____
3. **Controlled variables (*Constants***) are _____

   _____
4. It is important to have controlled variables because they keep the experiment _____.
5. List 3 controlled Variables (*constants*) in Mr. Koning's the plant experiment?
   A. _____
   B. _____
   C. _____
6. A **dependent variable (DV)** is _____
7. What was the dependent variable in Mr. Koning's plant experiment?

   _____
8. **Recap:** Why is it important to only have 1 Independent Variable in an experiment?

   _____

   _____

   _____

Practice: Identify the variables (IV, DV, and CV) for each of the following questions.

Question	Independent Variable IV	Dependent Variable DV	Constants CV
How does the day of the week affect how much time 6th graders spend exercising?			
How does the presence of dams affect the number of fish living in a river?			

Part 2: Formal Hypotheses (singular = hypothesis……plural = hypotheses)

A good hypothesis is an IF/Then statement that includes the following:
- ✓ The IV and DV
- ✓ A specific prediction about what will happen during your experiment.
- ✓ Explains why you made that prediction. This is reasoning. Your reasoning should be logical and include background knowledge that helped you make your prediction.

If _____ **affects** _____**, then** _____
(IV) *(DV)* *(prediction)*

Because _____
(Reasoning - explain why you made that prediction!)

Directions: Choose one question from the table on the front and write a formal hypothesis for the question.

If _____ affects _____,

then_____

_____

Because_____

_____

_____

_____

Part 3: Criteria and Constraints

Review your notes from the paddle boat engineering challenge and complete the following definitions.

1. For an engineering project, criteria are _____

   _____

2. For an engineer project, constraints are _____

   _____

Practice: Identify the criteria and constraints for the following engineering problem.

Using the available materials, build a paper table capable of holding a physics textbook. You will have 1 piece of cardboard (8 ½ inches x 11 inches), a physics textbook, masking tape and 8 sheets of newspaper.

Criteria: _____

_____

Constraints:_____

_____

_____

_____

_____

_____