## **WODSS SCIENCE**

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Name:
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Date: \_\_\_\_\_

## **Building Scientific Knowledge**

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Observation			
Inference			
Empirical Knowledge			
Theoretical Knowledge			
Theory			
Law			
Models			
		The Burning Candle	
Statement	Observatio n(O)/ Inference (I)	Statement	Observation (O)/ Inference (I)
Complete the following: Example. A nurse examinir Observation:			
Inference:			
Example 2. A firefighter sift Observation:		_	
Inference:			
Example 3. A chef tasting a Observation:	•	•	
Inference:			

## Worksheet: Building Scientific Knowledge Name: \_\_\_\_ 1. Classify each of the following statements as primarily empirical knowledge (E) or primarily theoretical knowledge (T). a. A yellow solid forms when two solutions are mixed. b. When 3 g of calcium chloride is added to water, the temperature of the water increases by 5°C. c. For a chemical reaction to take place, molecules must bump into each other under optimum conditions. Chemical reactions occur faster at higher temperatures because molecules possess more kinetic energy and move faster. Since they move faster, they are more likely to bump into each other, which may result in a reaction. d. In winter, as the temperature decreases, the molecules in the air in a tire move more slowly. Therefore, they do not bump into the sides of the wall of the tire as often, and so tire pressure is lower in the winter compared to summer. e. Atoms rearrange themselves during a chemical reaction in order to form new products. f. Ice melts at 0°C. \_\_\_\_\_ 2. Write a statement of observation and a statement of inference for each of the following situations: a. A forensic investigator probes the possibility of arson at a burned building. Observation: Inference: b. A cashier is short of funds at the end of a shift. Observation: Inference: c. A student receives a high grade on the last unit test. Observation:

Inference:

3.	The following article was posted on <i>The Globe and Mail</i> 's web site on Sunday, February 2, 2003, one day after the space shuttle <i>Columbia</i> exploded during re-entry.  a. Read the article  b. Using a highlighter, identify all the observations reported in the article  c. In the article, what inference is being made about the cause of the accident?
	d. Before investigations can suggest a theory to explain an event, they need to gather as much evidence (empirical knowledge) as possible. According to this article, what other empirical knowledge will investigators try to gather?
	e. "Mr. O'Keefe emphasized that the space agency was being careful not to lock onto any one theory too soon." Give reasons why it is important to gather as much empirical knowledge as possible first, and then formulate a theory.
	f. Reconstructing accidents is an example of modelling. Using the space shuttle <i>Columbia</i> accident as your example, explain how modelling helps when formulating a theory.