**A. Scientific Thinking**

**Science**

 **1. based on assumptions/methods that yield**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**information about nature**

**2. all truth is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_…**

**B. Scientific Method**

 **1. refers to habits of disciplined \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of one’s observations and conclusions**

 **2. *CAUTION*: health sciences fads and frauds**

 **3. making scientific judgements depends on an appreciation of \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, how they \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for truth and why their claims are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than others**

 **4. *Inductive Method***

**: process of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ until one feels confident in drawing generalizations and predictions from them**

**example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ known from observations of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**5. *Hypothetico-Deductive Method***

**examples of physiology**

**first hypothesis is formed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or possible answer to question**

**must be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_with what is known and capable of \_\_\_\_\_\_\_\_\_\_\_**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: if we claim something scientifically true, we must be able to specify what would prove it wrong**

**Think About It: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**6. Experimental Design : Considerations**

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: Would you rather trust a drug tested on 5 people or 5000?**

**\_\_\_\_\_\_\_\_\_\_\_: evidence that garlic lowers blood cholesterol (results 12% to 3%!)**

**Psychosomatic effects—the reason for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Experimental bias—can affect interpretation so \_\_\_\_\_\_\_\_\_\_\_\_\_\_method is used**

**Statistical testing: how great a difference must there be??**

**Peer Review: ensures honesty objectivity and quality in science**

**7. Research Yields Understanding which is expressed through**

**a) \_\_\_\_\_\_\_\_\_\_\_\_\_: info that can be independently verified by a trained person**

 **example: iron deficiency leads to anemia**

**b) \_\_\_\_\_\_\_\_\_\_\_\_\_(law of nature): generalization about predictable ways in which matter / energy behave ; descriptions (they don’t govern!)**

**result of inductive reasoning (repeated observations confirmed**

**verbal statement: 1st law of thermodynamic 🡪 Energy can be converted from one form to another but cannot be created or destroyed.**

**mathematical formulae: Boyles law 🡪 under specific conditions, the volume of a gas (V) is inversely proportional to its temperature (T): V ∞ 1/T**

**\*\*for us this relates to respiratory physiology**

**c) \_\_\_\_\_\_\_\_\_\_\_\_\_\_: explanatory statement or set of statements derived from facts, laws, and confirmed hypotheses**

**some have names: cell theory, sliding filament theory**

**most are unnamed**

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