## The Nature of Science

Biology

### What is Science?

A collection of facts and information

 A system for discovering new information (the "scientific method")

 A way of understanding the world that emphasizes:

- Explanations for what we see
- Predictions for things we might see or discover
- Testability and flexibility



## Why Follow These Rule?

- Because if we do, science becomes a very useful tool!
  - We can use it to design and engineer (phones, space travel)
  - We can use it to improve our world and lives (agriculture, pollution control, medicine)
  - It is internally consistent (the same rules apply to all sciences and all applications)
- If we don't, there are negative potential consequences:
  - Our predictions will be incorrect or –
  - We won't be making predictions at all!



### What is the Point of Science?

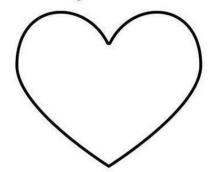
- To WORK. That's it.
  - Some scientists claim to be in search of "truth" that's their personal business, not the stated goal of science.
  - Explanations and predictions are what are valued and are far more important (in science) than being right.
  - When new information contradicts our existing theories or laws, we change those theories and laws.
- Science has an explanation of why your phone works. Does it really matter whether this explanation is "the truth"?



# What about Other Ways of Understanding?

- Love, faith, superstition, common sense these are all valid ways of understanding our world.
- Falling in love does not require and may be diminished – by a deep scientific analysis.
- Faith and religion might very well be The Truth.
- Science is DIFFERENT from these but not better – just more useful in certain contexts.

What People Think of Love



What Love Actually is

# Evolution vs. Creationism/Intelligent Design

#### • Evolution:

- Might be right, might be wrong
- Explains everything we see regarding the diversity of life
- Makes testable predictions regarding the future
- Can and has been changed as new information has been discovered

#### Creation:

- Might be The Truth
- Explains everything we see regarding the diversity of life
- Makes NO testable predictions regarding the future
- Not generally revised with new information (in fact, often the information is regarded as suspect)

### The Take-Home

- It's not about right or wrong
- It's not about Truth
- Evolution is compatible with existing science, explains/predicts, and is modified as our understanding grows
- Evolution is the SCIENTIFIC explanation for the diversity of life, not the ONLY (or even necessarily correct) explanation

