

Questions?

Different flavors and how to ask good ones!

4 simple steps to good science!

1. Observation
2. Question
3. Prediction/hypothesis
4. Test

Power's of observation

- Good science cannot be done without observation
- In the good ol' days of Aristotle all they relied on was their power of observation
- Well, into the early 1900's the art of observation was actually taught in major Universities
- Observation can occur in many forms:
 - 1st hand: using senses directly
 - 2nd hand: reading about someone else's observations or finding
 - acquired observations (information) should naturally lead to questions!

Questions: several flavors

- Proximate: the How's
 - mechanistic
 - deal with morphology, physiology, endocrine, neurological controls behavior
- Ultimate: the Why's
 - big picture, evolutionary view
 - deal with the ultimately consequences of behavior

Predictions and hypotheses

- Always best formulated from good questions and acquired observations
- What's the difference between a prediction and a hypothesis?
- Can make the next step much easier!

Test

- Predictions and hypotheses are really unsubstantiated without tests
- Experimental manipulations used to support or refute a hypothesis.
- Multiple types of tests are best
- Ultimate questions are the most difficult to develop tests for
- So, start simple with proximate questions and move to more ultimate questions

Practice makes perfect

- Like any artform, developing these skills takes practice.
- How good are your powers of observation?
- Can you formulate “good” questions, questions that lead to testable hypotheses?
- Let’s see how well you do...