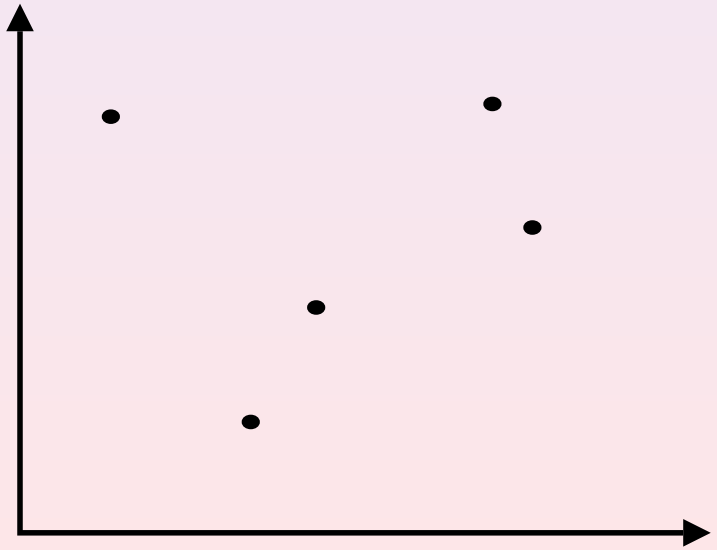
Hypothesis Testing

Dale Easley
University of Dubuque

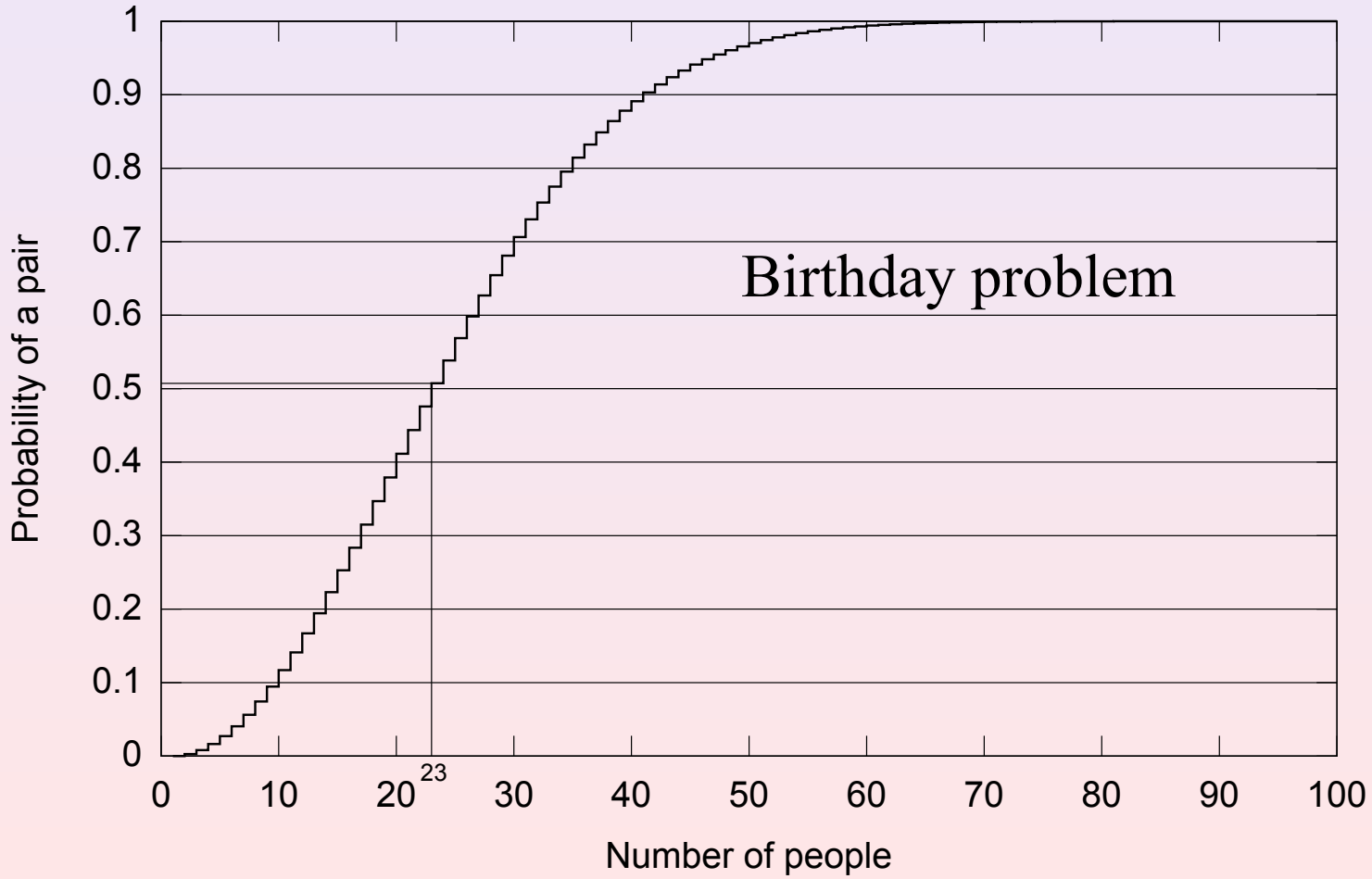
What's a pattern and what's random?

Our burden: Show that what we see is unlikely to occur by random process.



How likely is it?

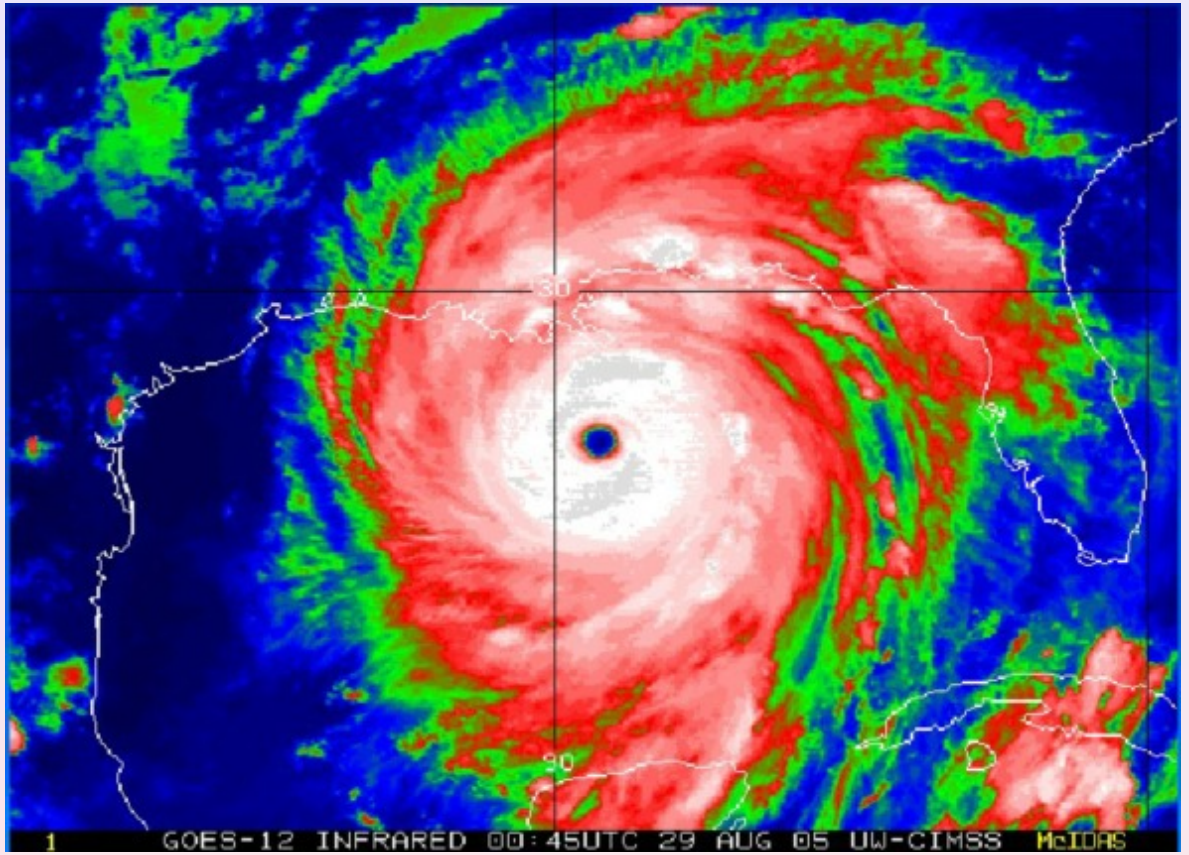
That's why we have to know the probabilities!



Impact of not knowing probabilities

- Stereotyping
- Superstition
- Poor decisions
- Fraud

Peter Popoff



Hurricane Katrina

Confirmation Bias

Think of an instance where you believed something was true, gathered data to support it, and were wrong!

The null hypothesis

Get with a partner and generate a null hypothesis for these situations:

- You want to test a new trap design, aimed at improving capture rate of turtles.
- A new drug claims to lower cholesterol.
- The bag says calcium chloride melts ice better than regular salt.
- Male squirrels are more active than female squirrels.
- Wolf diet is primarily deer.
- Brook trout prefer cold, clear streams.
- Salamanders have less reproductive success when the water they lay eggs in is high in nitrate.

How would you design an experiment to test your hypothesis?

What is proof?