

# Introduction to Scientific Research

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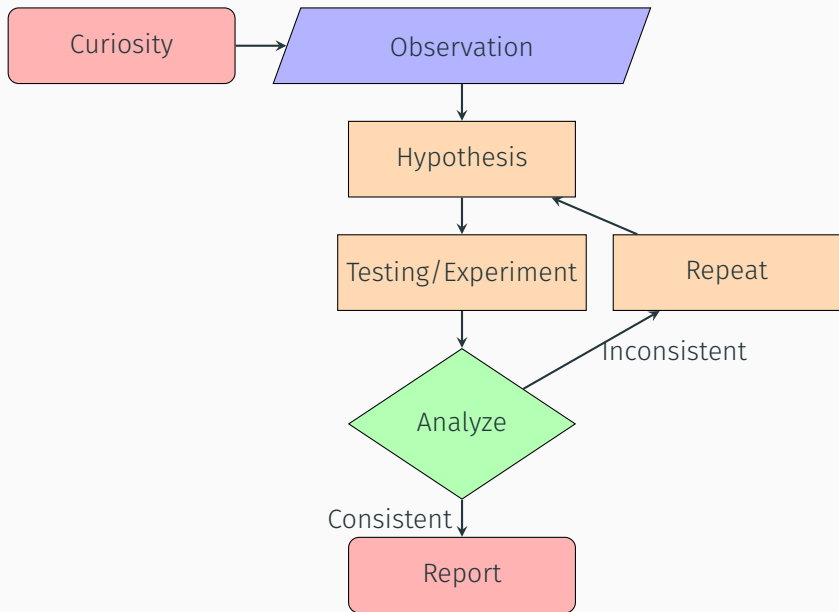
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August 31, 2016

BISC 104  
Session 1

Scientific research probes deepest mysteries  
of universe

# The Process



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# Elements of an experiment

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- **Dependent variable:** Changes due to change in independent variable [Measured/Observed]
- **Control variable:** Could possible affect dependent variable, so should be kept constant

## Example: Baking bread

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... Should remain constant

## Example: Baking bread

- **Hypothesis:** If amount of sugar increases, bread rises higher
- **Independent Variable:** Amount of sugar
- **Dependent Variable:** Size of loaf
- **Control Variables:** Water, salt, temperature, brand of ingredients  
... Should remain constant

Amount of Sugar	Size of bread
10g	600cm <sup>2</sup>
20g	700cm <sup>2</sup>
25g	710cm <sup>2</sup>
30g	715cm <sup>2</sup>

Analysis Table

Sample Size?

Variability?

## Example: Fertilizer and yield

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- **Hypothesis:** Fertilizer X gives a better yield over fertilizer Y
- **Independent Variable:** Amount of fertilizers X,Y
- **Dependent Variable:** Yield [kg/tonnes..]
- **Control Variables:** Watering frequency, temperature, weather conditions ....

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- Disperse!

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- Come up with proposals **that can be tested** and involves watching people at USC
- All groups vote to select the best proposal
- Form groups of 2, decide a day/time to collect data
- Disperse!
- Carry out your experiments, analyze your results.

We will go over analysis part in next session. Please email your analysis report by next Monday 5PM.

## Possible Analysis Table

Time-Day	# Males	# Females
1215-1245-Th	..	..
1310-1340-W	..	..
Total	..	..

Tuesday: 9-10AM

Wednesday: 9-10AM

ZSH 372

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**Please don't forget to mail your  
analysis/report by 5PM, Monday(09/05).**