Key question: Ask your friend if your topic sounds cool... Interesting topic with a significant impact!
### Examples?

<table>
<thead>
<tr>
<th>Ask yourself!</th>
<th>Population means, $\mu_1$ and $\mu_2$</th>
<th>Population proportions, $\pi_1$ and $\pi_2$</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. What are my two populations?</strong></td>
<td>Independent sample</td>
<td>Matched sample</td>
</tr>
<tr>
<td>MacDonald’s and Taco Bell</td>
<td>Home Depot and Lowe’s</td>
<td>LSU students and the general public</td>
</tr>
<tr>
<td><strong>2. What is the hypothesis I want to test?</strong></td>
<td>The average waiting time at Taco Bell is 30 seconds shorter than that at MacDonald’s?</td>
<td>On average, Home Depot is cheaper than Lowes?</td>
</tr>
<tr>
<td><strong>3. What is the variable of my interest?</strong></td>
<td>Average waiting time</td>
<td>Average price</td>
</tr>
<tr>
<td><strong>4. What will be my sample observations?</strong></td>
<td>More than 30 customers from each restaurant.</td>
<td>More than 30 identical items from each store.</td>
</tr>
</tbody>
</table>

In Session 12, your project belongs to **Case 1. Independent Sample for Mean**. **Case 2. Paired Sample for Mean**. **Case 3. Population Proportion**.

- **Two populations**: We and they, Before or after, Here and there!
* How to collect sample observations?

1. **Secondary data** from the Web, newspapers, or magazines.
   - Ex] Sports almanac, crime statistics, census data, prices...

2. **Survey data** (Attached a copy of the survey form in Appendix)
   - Questionnaires, Internet poll, telephone poll...
   - Ex] Face book friends, text messages, opinion poll ...

3. **Observational data**
   - Ex] Inspection stickers, stop sign, weight of eggs, service time,...

4. **Experimental data**
   - Ex] Coin flipping, drop your cat...

* Sample size?
  - At least **30**, but the more is the better!
1. Introduction
   - Significance of your study
   - Data collection

2. Descriptive statistics
   - Tables and graphs => Cut and paste into the text
   - Sample statistics => mean, median, mode, quartile, variance, range,…

3. Confidence interval estimations

4. Hypothesis testing
   - Equal?  - Yes. Then stop.
     - No. Then, one is larger than the other?
       - Yes. Then, one is larger than the other by $d$?
       - No. Then, stop.

5. Conclusion
   - Your findings => Newsworthy?
   - Limitations and improvement

* Write a written report for your boss who signs on your paychecks.
  Professionally prepared report: Equation, symbol, normal curve…