

Comparing Samples

1. **Cereal:** The data below show the sugar content (as a percentage of weight) of several national brands of children's and adults' cereals. Create and interpret a 95% confidence interval for the difference in mean sugar content. Be sure to check the necessary assumptions and conditions.

Children's cereals: 40.3, 55, 45.7, 43.3, 50.3, 45.9, 53.5, 43, 44.2, 44, 47.4, 44, 33.6, 55.1, 48.8, 50.4, 37.8, 60.3, 46.6

Adult's cereals: 20, 30.2, 2.2, 7.5, 4.4, 22.2, 16.6, 14.5, 21.4, 3.3, 6.6, 7.8, 10.6, 16.2, 14.5, 4.1, 15.8, 4.1, 2.4, 3.5, 8.5, 10, 1, 4.4, 1.3, 8.1, 4.7, 18.4

2. **Job Satisfaction:** A company institutes an exercise break for its workers to see if this will improve job satisfaction, as measured by a questionnaire that assesses workers' satisfaction. Scores for 10 randomly selected workers before and after the implementation of the exercise program are shown. Test an appropriate hypothesis and state your conclusion.

Worker Number	Job satisfaction index	
	Before	After
1	34	33
2	28	36
3	29	50
4	45	41
5	26	37
6	27	41
7	24	39
8	15	21
9	15	20
10	27	37

3. **Retirement:** The Employee Benefit Research Institute reports that 27% of males anticipate having enough money to live comfortably in retirement, but only 18% of females express that confidence. If these results were based on samples of 250 people of each gender, would you consider this strong evidence that men and women have different outlooks?

a.) Test an appropriate hypothesis and state your conclusion.

b.) If you concluded there was a difference, estimate that difference with a confidence interval and interpret your interval in context

4. **Reading:** An educator believes that new reading activities for elementary school children will improve reading comprehension scores. She randomly assigns third graders to an eight-week program in which some will use these activities and others will experience traditional teaching methods. At the end of the experiment, both groups take a reading comprehension exam. Their scores are shown in the back-to-back stem-and leaf display. Do these results suggest that the new activities are better? Test an appropriate hypothesis and state your conclusion.

New Activities		Control
	1	0 7
4	2	068
3	3	377
96333	4	122238
9876432	5	355
721	6	02
1	7	
	8	5

5. **Retention Rates:** In 2004 the testing company ACT, Inc., reported on the percentage of first-year students at 4-year colleges who return for a second year. Their sample of 1139 students in private colleges showed a 74.9% retention rate, while the rate was 71.9% for the sample of 505 students at public colleges.
- Create a 95% confidence interval for the differences in retention rates between private and public colleges.
 - Based on this confidence interval, what conclusion would we reach if we tested the hypothesis that there's no difference in the retention rates between private and public colleges.