Test	Description	Example	Formulas
Z-score --- Z-test	→ Not hypothesis testing → Relies on normal distribution → Standard Deviation of the population is known → Only used to talk about a single score and where it falls relative to the population --- → Used as a statistical test to distinguish between hypotheses → Relies on normal distribution → Population standard deviation must be use to estimate the standard deviation of your sample	(1) Single score: You know that the mean height of the population is 68", with a population SD of 4". You want to figure out what percentile a single person falls (eg. X = 70"). **Note**: No hypotheses. --- (2) Sample: You know that the mean height of the population is 68", with a population SD of 4". You want to test if the BC basketball team (your sample) is statistically different than the population in terms of height. Two-tailed hypotheses: H_0: μ = 68 H_1: μ ≠ 68	**(1) If calculating the Z for a single score (X):** $z = \frac{X - \mu}{\sigma}$ → Then, use table to get proportion under the curve --- **(2) If calculating the Z for a sample ($\bar{X}$):** $SEM = \frac{\sigma}{\sqrt{N}}$ $z = \frac{\bar{X} - \mu}{SEM}$
One Sample T-Test	→ Relies on t-distribution → Standard Deviation of the population is unknown → Comparing a single mean to the population → Use T-distribution table for t-critical value (need: d.f., α, 1 or 2 tailed) → d.f.= N -1	→ You know that the mean height of the population is 68", but you are not sure of the population SD. You want to test if the BC basketball team (your sample) is statistically different than the population in terms of height. Two-tailed hypotheses: H_0: μ = 68 H_1: μ ≠ 68	**(1) You need to get the standard deviation from your sample:** $S = \sqrt{\frac{Sum\ of\ Squares}{N-1}} : \sqrt{\frac{SS}{N-1}}$ **(2) Use sample standard deviation (S) to get SEM:** $SEM = \frac{S}{\sqrt{N}}$ **(3) Calculate t-obtained:** $t - obtained = \frac{\bar{X} - \mu}{SEM}$
Within-Subjects T-Test	→ Relies on t-distribution → Standard Deviation of the population is unknown → Comparing Condition 1 and Condition 2, in which each participant completes both conditions → You use the difference score here → d.f.= N -1	→ You want to measure whether people read faster with white noise or with classical music. You test all participants on both conditions: (1) white noise, (2) classical music. Each participant will have 2 data points, which are dependent. Two-tailed hypotheses: H_0: $\mu_D = \mu_1 - \mu_2 = 0$ **or** $\mu_1 = \mu_2$ H_1: $\mu_D = \mu_1 - \mu_2 \neq 0$ **or** $\mu_1 \neq \mu_2$	**(1) Calculate the Mean Difference ($\bar{X}_D$): Condition 1-Condition 2** **(2) Calculate Sum of Squares (SS) from data table** **(3) Calculate the standard deviation from your sample** $S = \sqrt{\frac{Sum\ of\ Squares}{N-1}} : \sqrt{\frac{SS}{N-1}}$ **(4) Use sample standard deviation (S) to get SEM** $SEM = \frac{S}{\sqrt{N}}$ **(5) Calculate t-obtained** $t - obtained = \frac{\bar{X}_D - \mu_D}{SEM}$
Between-Subjects T-Test	→ Relies on t-distribution → Standard Deviation of the population is unknown → 2 different samples: 1 sample completes Condition 1, and the other completes Condition 2 → Samples are completely independent	→ You want to measure the effect of a stroke on math abilities. You give a math test to 2 conditions: (1) stroke group, (2) control group. Two-tailed hypotheses: H_0: $\mu_D = \mu_1 - \mu_2 = 0$ **or** $\mu_1 = \mu_2$ H_1: $\mu_D = \mu_1 - \mu_2 \neq 0$ **or** $\mu_1 \neq \mu_2$	*CHAPTER 14: WILL BE COVERED IN THE FUTURE*