AP Statistics Unit 2, Lesson 3 — Watch-Along Worksheet

Statistics for Two Categorical Variables & Association

Name: _____ **Period:** _____ **Date:** _____

> 💡 **WATCH-ALONG TIP:** Circle or underline the key phrase that tells you the denominator!

> • "of the people in the survey" → grand total • "of those with..." → row total • "of those [age]..." → column total

> 📺 **Instructions:** Fill in the blanks as you watch Luke Wilcox's video. Use timestamps to stay on track!

A) Setup: The Two-Way Table *(00:31-01:37)*

Fill in the table as shown in the video. Label all totals!

Educational Level ↓	25-34	35-54	55+	Row Total
No HS diploma	_____	_____	_____	_____
HS diploma only	_____	_____	_____	_____
Some college	_____	_____	_____	_____
Master's+	_____	_____	_____	_____
Column Total	_____	_____	_____	**Grand Total:** _____

B) Key Definitions *(02:27-06:00)*

Joint Relative Frequency = (_____ value) ÷ (_____ total) × 100%

Marginal Relative Frequency = (_____ or _____ total) ÷ (_____ total) × 100%

Conditional Relative Frequency = (cell within one _____) ÷ (that _____ or _____ total) × 100%

C) Practice Problems — Calculate Along with Video

Remember: Circle the key phrase first, then identify the type!

1) What percent of people are 25-34 years old with a Master's degree? *(01:39-02:27)*

[Type: **Joint**] Frame: _____ *(cell: 25-34 & Master's+)* ÷ _____ *(grand total)* × 100 = _____% *(≈2.1%)*

2) What percent have only a high school diploma? *(02:52-03:32)*

[Type: **Marginal**] Frame: _____ *(row total: HS)* ÷ _____ *(grand total)* × 100 = _____% *(≈39%)*

3) What percent are 35-54 years old? *(03:34-04:05)*

[Type: **Marginal**] Frame: _____ *(column total: 35-54)* ÷ _____ *(grand total)* × 100 = _____% *(37.6%)*

4) Of those with only HS diploma, what percent are 35-54? *(04:35-05:13)*

[Type: **Conditional**] Frame: _____ *(cell: HS & 35-54)* ÷ _____ *(row total: HS)* × 100 = _____% *(≈34.1%)*

5) Of those 25-34 years old, what percent have no HS diploma? *(05:15-05:49)*

[Type: **Conditional**] Frame: _____ *(cell: No HS & 25-34)* ÷ _____ *(column: 25-34)* × 100 = _____% *(7.2%)*

D) Visualizing Association *(06:20-07:24)*

Draw or paste the segmented bar graph here. **Each bar = 100%! Keep segment order consistent!**

[Segmented Bar Graph Space]

E) The Big Question: Are They Associated? *(07:27-08:06)*

🎯 **Decision Rule:** Compare <u>conditional</u> relative frequencies across groups

Because the distribution of conditional relative frequencies is ☐ **THE SAME** ☐ **DIFFERENT**

across age groups, the variables are ☐ **NOT associated** ☐ **ASSOCIATED**

Evidence: Write 1-2 specific conditional percentages that support your conclusion:

_____

F) Quick Check — Identify the Type

Answer Bank: J = Joint, M = Marginal, C = Conditional *(use each at least once)*

Question Phrase	Type
"What percent of the people in the survey..."	_____
"Of those who..., what percent..."	_____
"What percent are BOTH young AND educated?"	_____
"Given that they have X, what percent also have Y?"	_____

G) ⚠ Common Pitfalls to Avoid

☐ Using grand total when prompt says "of those..." (use row/column total instead)
☐ Comparing raw counts instead of conditional percentages for association
☐ Forgetting that each segmented bar must total 100%
☐ Using inconsistent segment order across bars in segmented bar graph
☐ Mixing up row and column conditions in conditional relative frequencies

H) Exit Ticket — Create Your Own Questions

Write one question of each type about this table:

Joint RF: _____

_____

Marginal RF: _____

_____

Conditional RF: _____

_____

> 📝 **KEY TAKEAWAY:** To determine association, compare <u>conditional</u> relative frequencies.

> If they're **different** across groups → associated. If they're the **same** → not associated.

Great job! Up next: Mr. Dash Youngsaver! 🎬