

**FOCUS/AIM:** How can patterns in data help us make decisions? GRADE 7 ([Computer Science Discoveries Unit 5 Lesson 11](#))

**SWBAT**

- Use cross tabulation to find patterns and relationships in data
- Visually organize data to highlight relationships and support a claim

**Standards:**

- 7-8.CT.3 Refine and visualize a data set in order to persuade an audience. Clarifying Statement Refining includes, but is not limited to, identifying relevant subsets of a data set, deleting unneeded data, and sorting and organizing data to highlight trends.
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**Warm Up**

- What type of cake and frosting/icing do you like?

Look at the cake and icing flavors from a survey of 8 people.

- If you could choose one cake with icing, what would it be? Why?
  - If people had to agree on one cake and icing combination for a party, what should it be? Why? Share Out: Have students share their choices and why.
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**Teacher delivered content**

- *There is no one recommendation that is correct, although chocolate was the most popular cake flavor and cream cheese was the most popular icing flavor, only one person chose a chocolate cake with cream cheese icing.*
  - *It's not enough to look at the two answers in isolation. For example, if two cakes are chosen, chocolate cake with chocolate icing and carrot cake with cream cheese icing is much better than chocolate with cream cheese and carrot with chocolate. Looking at the relationships between answers helps to see which choices go well together.*
  - *Sometimes it's not enough to look at just one type of data. You need to look at how different types of data relate together.*
  - *Elicit - how do you define Data: Information. Often, quantities, characters, or symbols that are the inputs and outputs of computer programs.*
  - *Today, we're going to look at one way that we can find relationships in data to help us solve problems.*
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**Mini Lesson - Model Activity**

- Give each group a copy of the activity guide and data resource. In the do now there were only eight results, so we could look at the answers and get a good idea of the relationships between them. In this survey, we have a lot more results, so we're going to use a chart to count them up. T models
- Model how to fill in the chart with the class. For each row of the survey results, add one tally to the chart. After modeling the first five rows, allow students to complete the rest of the chart on their activity guide. Direct students to complete the worksheet in their groups.
- Check for Understanding: If someone likes cats, what activity is probably their favorite? What is one more interesting relationship between favorite pet and favorite activity?

## Finding Relationships Example

#	Favorite Pet	Favorite Activity	Favorite Sport
1	Cat	Art	Soccer
2	Cat	Art	Basketball
3	Dog	Video Games	Soccer
4	Cat	Art	Soccer
5	Dog	Video Games	Soccer

Pets and Activities

	Dog	Cat	Bird	Snake
Camping				
Art				
Video Games				
Music				

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Camping				
Art				
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Music				

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Art				
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Camping				
Art				
Video Games				
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Pets and Activities

	Dog	Cat	Bird	Snake
Camping				
Art				
Video Games				
Music				

### Differentiation:

- SDI per student's IEP; Spanish/Arabic translations;
- Students choose to complete one (mild), two (medium) or three (spicy) of the data sets
- Flexible grouping: Heterogeneous grouping for SwDs; Homogeneous for ELLs

### Exercise/Assignment/Learning Activity

- Students should use the chart to find relationships between the preferences so that they can differentiate between subgroups. They may note that although people who chose cats tended to choose art, people who chose dogs tended to like music.
- Make sure that the class produces examples of the predictions working in both directions (pet to activity and activity to pet). For example, people who like video games are likely to prefer dogs.
- There is nothing in the survey that helps them to understand why a relationship is true, only that the relationship exists.
- Share Out: Before moving on to the reflection question, give students a chance to share anything interesting that they learned about the relationships between the different preferences.

### Reflection/Summary:

- Share-Out: Allow students time to write down their answer, then check with their group before sharing out as a class.

### Exit Ticket:

- How could knowing relationships between these types of preferences help you to address a real-world problem?

### Homework

1. What's another data problem you could think of that you could use this method to help

solve?

2. What questions would you ask?
3. What relationships would you look for?

## Preferences Survey

Twenty five people took a survey about their preferences, and the results are included in the chart below. You can use the results of this survey to find relationships between the respondents' preferences.



#	Favorite Pet	Favorite Activity	Favorite Sport
1	Cat	Art	Soccer
2	Cat	Art	Basketball
3	Dog	Video Games	Soccer
4	Cat	Art	Soccer
5	Dog	Video Games	Soccer
6	Snake	Video Games	Soccer
7	Dog	Music	Soccer
8	Snake	Music	Volleyball
9	Snake	Camping	Basketball
10	Bird	Camping	Basketball
11	Dog	Music	Volleyball
12	Bird	Music	Soccer
13	Cat	Video Games	Swimming
14	Dog	Camping	Swimming
15	Dog	Music	Basketball
16	Cat	Art	Basketball
17	Snake	Camping	Volleyball
18	Dog	Camping	Swimming
19	Dog	Music	Basketball
20	Cat	Art	Basketball
21	Dog	Music	Swimming
22	Dog	Video Games	Swimming
23	Cat	Music	Swimming

24	Cat	Music	Swimming
25	Dog	Music	Swimming

Name(s) \_\_\_\_\_ Period \_\_\_\_\_ Date \_\_\_\_\_

## Activity Guide - Interpreting Data



### Finding Relationships

In order to find relationships between the preferences, you'll do a cross tabulation of the data. That means that you don't just count how many people liked each thing (e.g. "dog"), but how many people liked two things together ("dogs" and "camping"). This will help you see how different answers relate to each other.

#### Pets and Activities

	Dog	Cat	Bird	Snake
Camping				
Art				
Video Games				
Music				

If someone likes cats, what activity is likely their favorite? \_\_\_\_\_

What is one more interesting relationship between favorite pet and favorite activity?

\_\_\_\_\_  
\_\_\_\_\_

#### Pets and Sports

	Dog	Cat	Bird	Snake
Swimming				
Soccer				
Basketball				
Volleyball				

What are two interesting relationships between favorite pet and favorite sport?

1. \_\_\_\_\_  
\_\_\_\_\_  
2. \_\_\_\_\_  
\_\_\_\_\_

### Activities and Sports

	Cam ping	Art	Vide o Gam es	Musi c
Swimming				
Soccer				
Basketball				
Volleyball				

What are two interesting relationships between favorite activity and favorite sport?

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_

Reflection: How could relationships between these types of data help you to address a real world problem?

\_\_\_\_\_

Name(s) \_\_\_\_\_ Period \_\_\_\_\_ Date \_\_\_\_\_

### Activity Guide - Interpreting Data



### Finding Relationships

In order to find relationships between the preferences, you'll do a cross tabulation of the data. That means that you don't just count how many people liked each thing (e.g. "dog"), but how many people liked two things together ("dogs" and "camping"). This will help you see how different answers relate to each other.

### Pets and Activities

	Dog	Cat	Bird	Snake
Camping	11		1	11
Art		1111 1		
Video Games	111	1		1
Music	1111	11	1	1

If someone likes cats, what activity is likely their favorite? \_\_\_\_\_art\_\_\_\_\_

What is one more interesting relationship between favorite pet and favorite activity?

people who like dogs like music more than other people

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What are two interesting relationships between favorite pet and favorite sport?

1. people who like snakes like volleyball more

2. people who like dogs like swimming more

#### Pets and Sports

	Dog	Cat	Bird	Snake
Swimming	11111	111		
Soccer	111	11	1	1
Basketball	11	111	1	1
Volleyball	1			11

What are two interesting relationships between favorite activity and favorite sport?

1. people who like swimming like music

2. people who like soccer like video games, but don't like camping.

#### Activities and Sports

	Camping	Art	Video Games	Music
Swimming	11		11	1111
Soccer		11	111	11
Basketball	11	111		11
Volleyball	1			11

Reflection: How could relationships between these type of data help you to address a real world problem?

I could try to get people to adopt pets from the shelter. If they like art, I could show them cats and if they like music I could show them dogs.