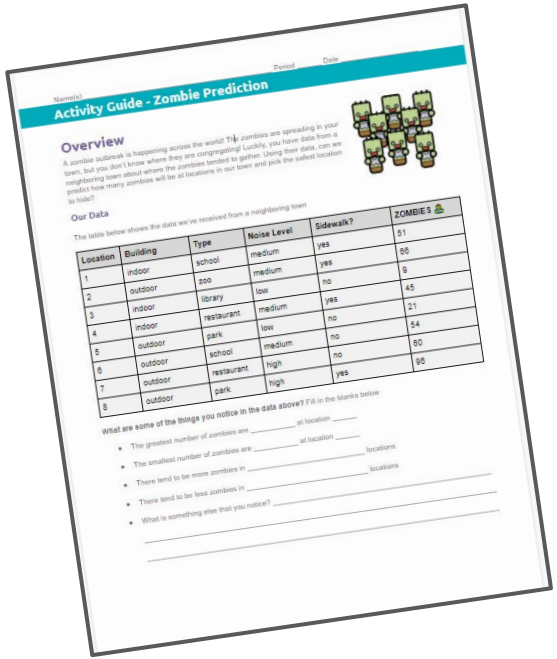
When Your Neighbor is a Zombie: Zombie KNN

Distribute

You should have:
Zombie Prediction Activity Guide
Pen/Pencil



Name(s) Period Date

Activity Guide - Zombie Prediction

Overview

A zombie outbreak is happening across the world! The zombies are spreading in your town, but you don't know where they are congregating! Luckily, you have data from a neighboring town about where the zombies tended to gather. Using their data, can we predict how many zombies will be at locations in our town and pick the safest location to hide?

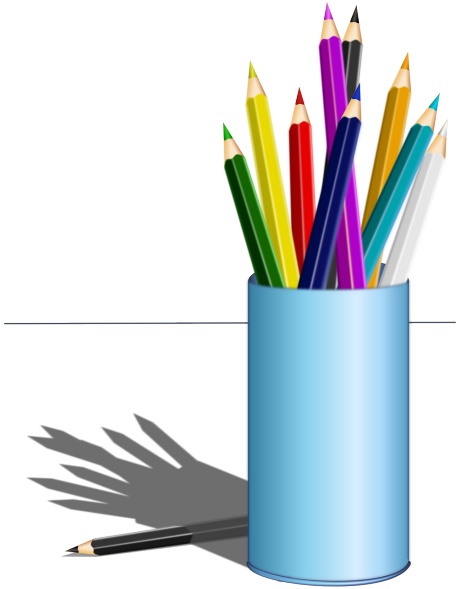
Our Data

The table below shows the data we've received from a neighboring town

Location	Building	Type	Noise Level	Sidewalk?	ZOMBIES
1	indoor	school	medium	yes	51
2	outdoor	zoo	medium	yes	86
3	indoor	library	low	no	9
4	indoor	restaurant	medium	yes	45
5	outdoor	park	low	no	21
6	outdoor	school	medium	no	54
7	outdoor	restaurant	high	no	80
8	outdoor	park	high	yes	95

What are some of the things you notice in the data above? Fill in the blanks below

- The greatest number of zombies are _____ at location _____
- The smallest number of zombies are _____ at location _____
- There tend to be more zombies in _____ locations
- There tend to be less zombies in _____ locations
- What is something else that you notice? _____



Overview

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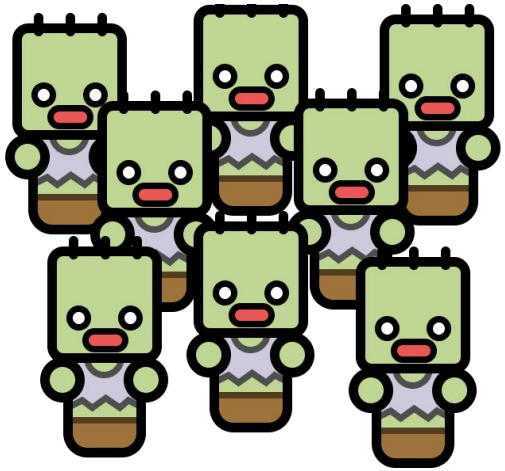

Do This

Look over the table, then answer the questions at the bottom of the activity guide.

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5	outdoor	park	low	no	21
6	outdoor	school	medium	no	54
7	outdoor	restaurant	high	no	60
8	outdoor	park	high	yes	96

Share Out

- The greatest number of zombies are _____ at location _____
- The smallest number of zombies are _____ at location _____
- There tend to be more zombies in _____ locations
- There tend to be less zombies in _____ locations
- What is something else that you notice?

Creating a Model

In order to turn this data into a model that can make a prediction, we'll use a technique to make similarity-based recommendations.

This involves taking new data and finding similarities with the data you already have.

Here is information about one location that is close to us

Location	Building	Type	Noise Level	Sidewalk?	ZOMBIES
A	indoor	restaurant	low	no	

Do This

Compare Location A with the features from the previous data:

- Anytime a column from Location A matches a column for another location, that's one point of similarity.
- After comparing each column, you can add up all the points of similarity.
- Use the table below to keep track of how similar Location A is to the other locations.
- The first two rows have already been completed.

Location	Building	Type	Noise Level	Sidewalk?	ZOMBIES
A	indoor	restaurant	low	no	

Location	Building	Type	Noise Level	Sidewalk?	ZOMBIES 🧟	A Similarities
1	indoor	school	medium	yes	51	\
2	outdoor	zoo	medium	yes	66	0
3	indoor	library	low	no	9	
4	indoor	restaurant	medium	yes	45	
5	outdoor	park	low	no	21	
6	outdoor	school	medium	no	54	
7	outdoor	restaurant	high	no	60	
8	outdoor	park	high	yes	96	

Share Out

The three locations most similar to Location A are: _____, _____, and _____

To predict how many zombies could be at this location, we need to take the average of the three most similar locations.

- Calculate the sum by adding together all the zombie values from these locations: _____
- Divide the sum by the number of values: _____
- Write this value in the Zombies column. That's the prediction!

Location	Building	Type	Noise Level	Sidewalk?	ZOMBIES
A	indoor	restaurant	low	no	

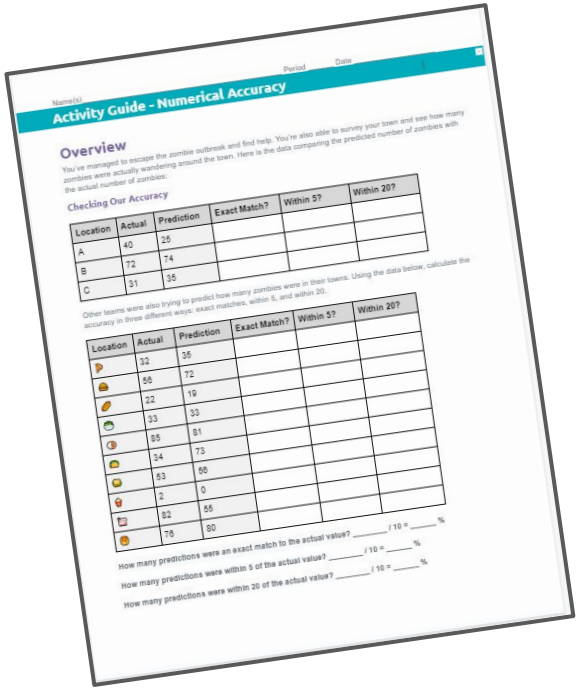
Do This

There are two other locations that are nearby. We need to decide whether to go hide at location A, B, or C.

Use the same strategy to predict how many zombies will be at location B and at location C.

Location	Indoor/Outdoor	Type	Noise Level	Has Sidewalk?	ZOMBIES 🧟
B	outdoor	restaurant	high	yes	
C	indoor	school	low	yes	

Distribute



Name(s) Period Date

Activity Guide - Numerical Accuracy

Overview

You've managed to escape the zombie outbreak and find help. You're also able to survey your town and see how many zombies were actually wandering around the town. Here is the data comparing the predicted number of zombies with the actual number of zombies:

Checking Our Accuracy

Location	Actual	Prediction	Exact Match?	Within 5?	Within 20?
A	40	25			
B	72	74			
C	31	35			

Other teams were also trying to predict how many zombies were in their towns. Using the data below, calculate the accuracy in three different ways: exact matchers, within 5, and within 20.

Location	Actual	Prediction	Exact Match?	Within 5?	Within 20?
	32	35			
	56	72			
	22	19			
	33	33			
	85	81			
	34	73			
	53	55			
	2	0			
	82	55			
	78	80			

How many predictions were an exact match to the actual value? _____ / 10 = _____ %

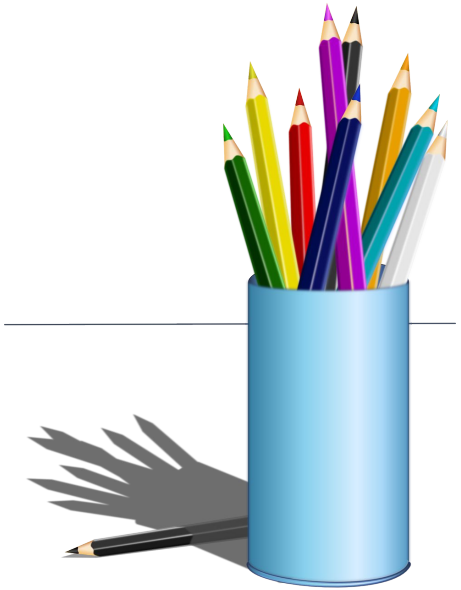
How many predictions were within 5 of the actual value? _____ / 10 = _____ %

How many predictions were within 20 of the actual value? _____ / 10 = _____ %

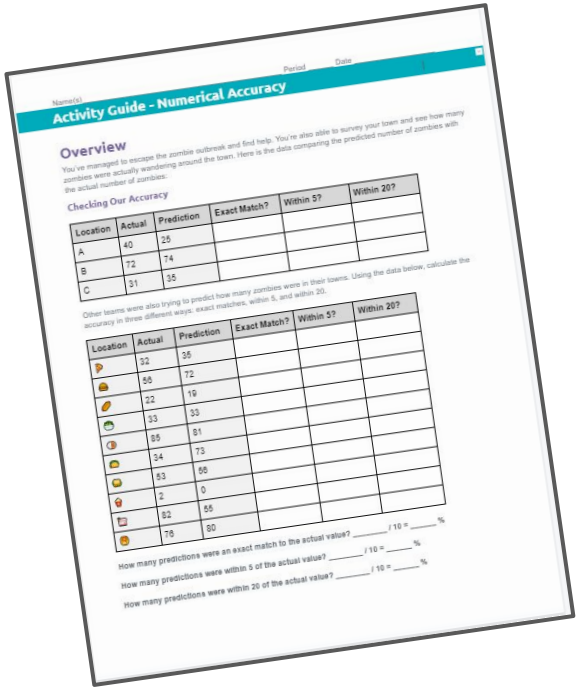
You should have:

Numerical Accuracy Activity Guide

Pen/Pencil



Overview



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How many predictions were an exact match to the actual value? _____ / 10 = _____ %

How many predictions were within 5 of the actual value? _____ / 10 = _____ %

How many predictions were within 20 of the actual value? _____ / 10 = _____ %

You've managed to escape the zombie outbreak and find help. You're also able to survey your town and see how many zombies were actually wandering around the town.

Here is the data comparing the predicted number of zombies with the actual number of zombies

Discuss

Based on the results, how many locations did the model predict exactly correct? What was the accuracy of our model?

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Location	Actual	Prediction
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_____ / 3 Correct = _____% Accuracy

Discuss

How many locations did the model predict correct within 5?
How many locations did the model predict correct within 20?

Location	Actual	Prediction
A	40	25
B	72	74
C	31	35

Within 5: _____ / 3 Correct = _____% Accuracy
Within 20: _____ / 3 Correct = _____% Accuracy

Do This

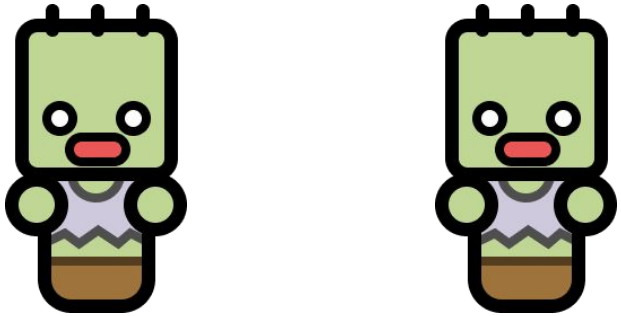
Look at the data in the table and calculate the accuracy of our model using these three different approaches.

- **Exact Matches:** _____ / 10 Correct = _____% Accuracy
- **Within 5:** _____ / 10 Correct = _____% Accuracy
- **Within 20:** _____ / 10 Correct = _____% Accuracy

Discuss

In one of the rows, the model predicted 0 but the actual value was 2. Is this close enough to count as a correct prediction?

Location	Actual	Prediction
	2	0

Discuss

In one of the rows, the model predicted 0 **zombies** but the actual value was 2 **zombies**. Even though this is close enough to be correct, is that okay for the people in this situation?