POPULATIONS AND PREDICTIONS

PROMISE

SANFORD RESEARCH

WHAT POPULATIONS DO YOU KNOW ABOUT?

Take one piece of paper and divide into 3 columns.

Label each column with one of these words:

K=Know

W=Want to know

L=Learned

KNOW	WANT TO KNOW	LEARNED
Write about 3 populations you know about.	Write about some populations you would like to know about.	What did you learn about populations? (Complete after activity)

UNDERSTANDING POPULATIONS

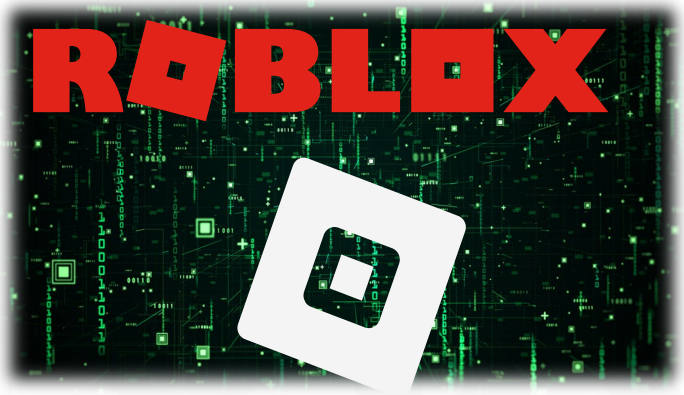
Genetics

Behavior

Geography

SIMULATIONS

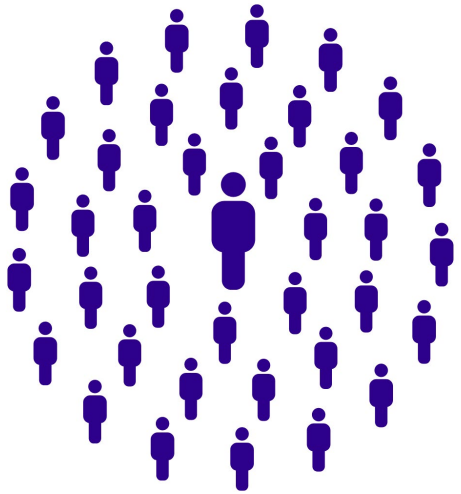
A simulation is a way of seeing a thing happen without it taking place in the same way. A simulation can be used to predict what might happen without doing it, in case it is dangerous or too expensive or difficult. It can also be used to show people what will happen next, or what happened in the past.



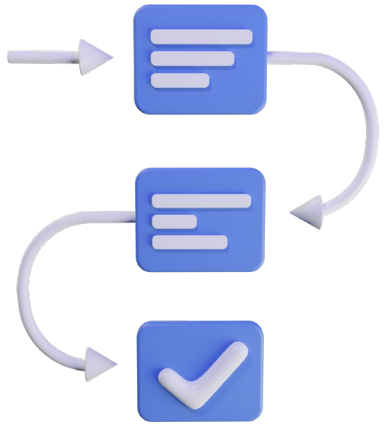
Computer simulation

Games (hide and seek)

SIMULATION GOALS

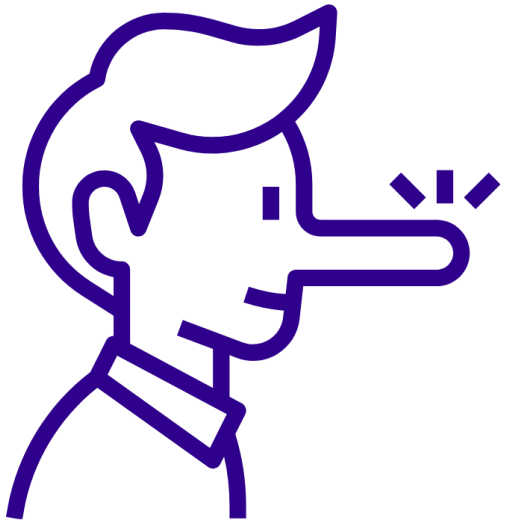


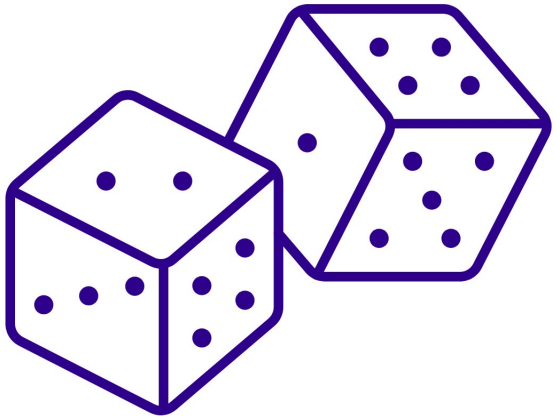
Simulate a population



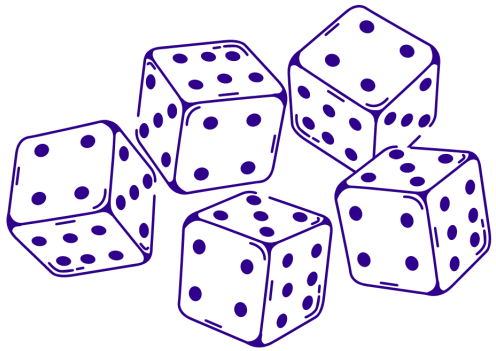
Model the process of learning the natural history of a condition

LEARN THE RULES FOR LIAR'S DICE





WHAT DO WE NEED TO PLAY?



1. 5 dice per person

2. 4 people

WHAT DO WE NEED TO PLAY?

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Liar's Dice: How to Play

Overview

Liar's Dice has a balance between luck and strategy, since you can bluff and deceive your friends about what you rolled.
In the variation outlined below, each player starts with 5 dice and is typically played with 3-5 players.

Summary

Choose who goes first	**Each player rolls one die, highest die rolled goes first.**
The start of each round	**Each player rolls all of their dice and keeps the numbers hidden from the other players.**
First turn	**Player bids a number on a dice and a number of dice showing that number.** Example "2 two's"
The next player's turn	**Play continues around the players in clockwise fashion. After the first player, each player has 2 options:** 1.Raise the Bid 2.Challenge
Bid	**A player may raise the bid in one of 3 ways:** 1.**Increase the number of dice** a. Example: If the first bid is "two 3s," the next player could bid "three 3s," 2.**Increase the number on the dice** a. Example: If the first bid is "two 3s," the next player could bid "two 4s," 3.**Increase both the number of the dice and the number on the dice** a. Example: If the first bid is "two 3s," the next player could bid "three 5s."
Challenge	**If a player decides to challenge they will say either "Challenge" or "Liar"** When this event happens, all players reveal all of their dice and all of the dice are counted. If there are fewer dice than the player bid, then the player loses a die. If there are equal or more dice than the bid, the Challenger loses a die.
After a challenge	**After a challenge, a new round starts all players roll the dice that they have left. The player that lost the challenge takes the first turn and play continues.**
Winning the game	**The game is won when only one player has dice left.**

PROMISE

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NAME _____ DATE _____

POPULATIONS AND PREDICTIONS DATA COLLECTION

Record information about your games of Liar's Dice.
The next page has descriptions of what should be recorded in each row.

Round	0	1	2	3	4	5	6	7	8	9	10
How many times I bid											
Record your dice											
Total Count of dice											
Final bid "Count"											
Final bid "Value"											
Did the Challenge win?											
Percentage of total dice my population represents.											

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NAME _____ DATE _____

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Using the data table below, calculate the **Mean, Median, Mode,** and **Range** for all values: "Final Bid Count", "Final Bid Value", and one more category of your choice.

	Mean	Median	Mode	Range
Final Bid Count				
Final Bid Value				
Your Choice				

Mean - The average of all the numbers.
Median - The middle number, when in order.
Mode - The most common number.
Range - The largest number minus the smallest number.

1. If you were playing a big game with your whole class and 300 dice were rolled how many 1's would you expect to see?
   a. How many 2's or 6's would you expect to see?

   b. How many odd numbers should be shown on the dice?

2. When 300 dice are rolled, why might it be better to estimate the number expected than to count the number. What about with 300,000 dice?
   a. Why is it important to sample a population sometimes instead of looking at the entire population?

WHAT HAPPENS IF I CHALLENGE?

Player 2

Player 1

Player 3

Player 4

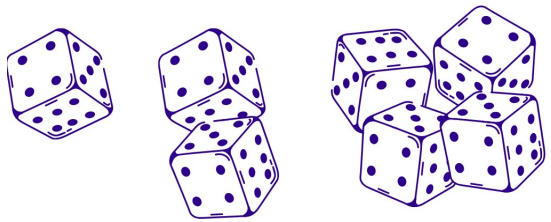
Everyone should reveal all their dice.

Count how many of each face of the die are visible.

Declare the winner.

HOW DO I BID ON THE DICE?

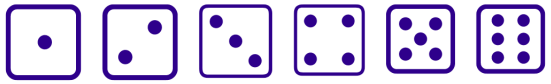
Increase the number of dice



Example: If the first bid is “two 3s,” the next player could bid “three 3s,”

or

Increase the number on the dice



Example: If the first bid is “two 3s,” the next player could bid “two 4s,”

or

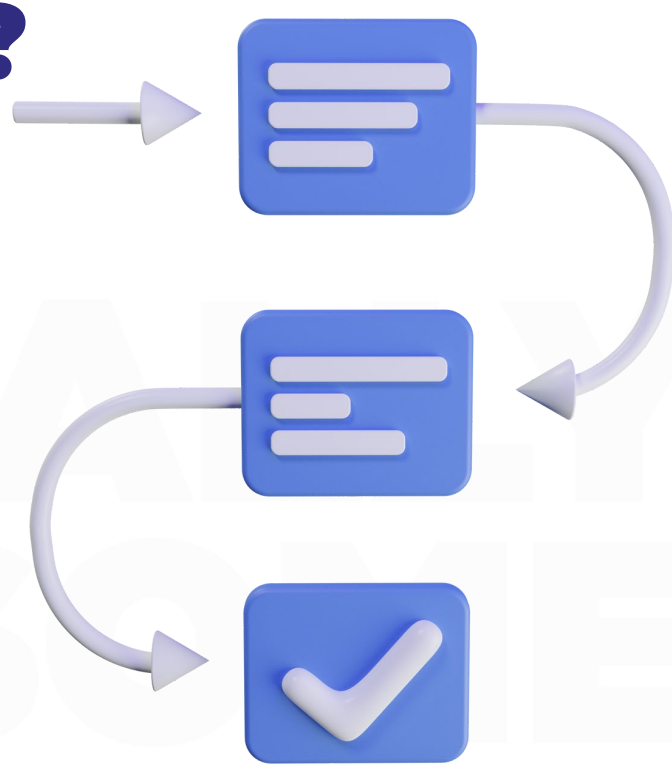
Increase both the number of dice and number on the dice

Example: If the first bid is “two 3s,” the next player could bid “three 5s.”

GATHER DATA

1. Observations
2. Record data on the data collection worksheet.
3. Answer questions in the student lab journal (Results)
4. Next steps (Design an algorithm)

WHAT IS AN ALGORITHM?



A computable set of steps to achieve a desired result.

Could you write out the steps to creating a peanut butter and jelly sandwich? Watch the video!

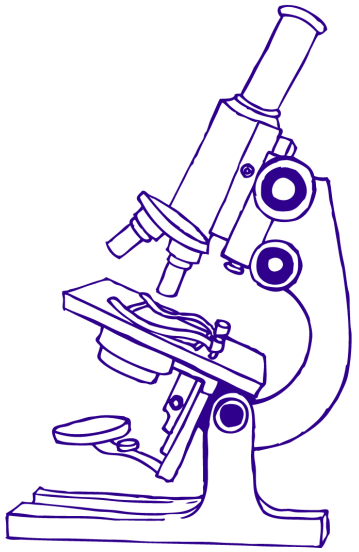
SUSTAINING A POPULATION

1. What is the benefit of caring for members of your population?
2. What is the benefit of producing a lot of offspring, but not caring for them?
3. How can understanding a population help us take care of them?

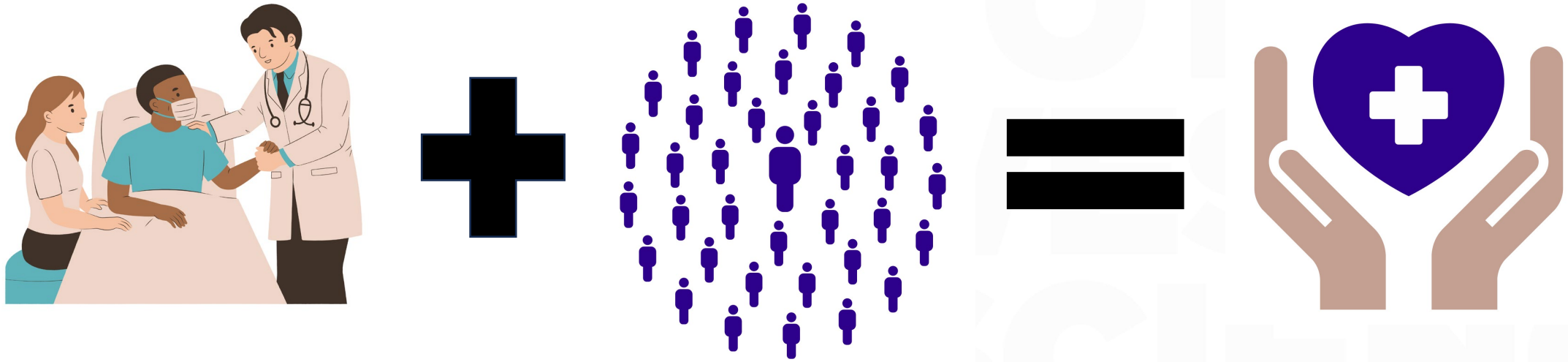
NATURAL HISTORY

When you were learning the rules of the game and making decisions you were learning how to play the game.

When doctors and scientists study diseases and conditions, they learn its natural history.



NATURAL HISTORY AND POPULATION STUDIES

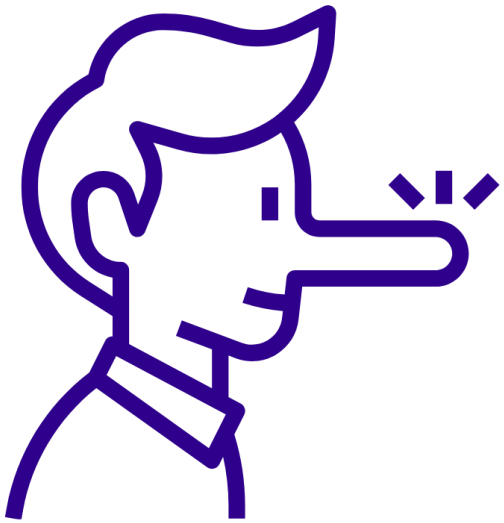


Natural History + Population Studies = Improved Health Care

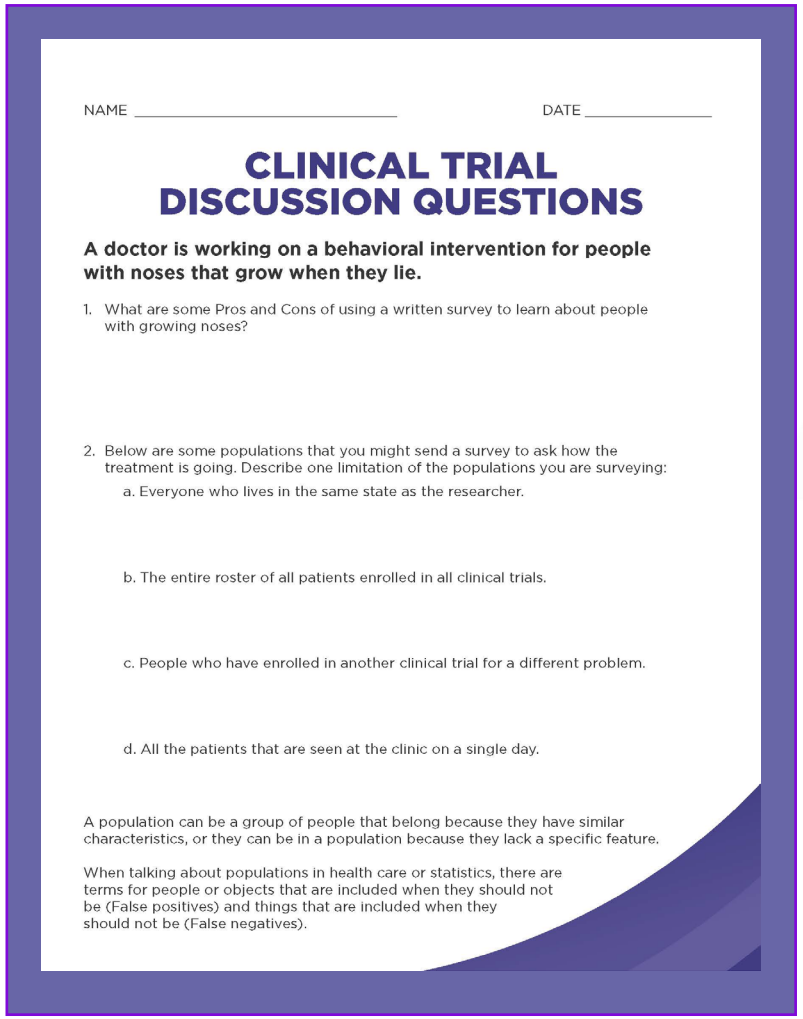
PINOCCHIO SIMULATION (DISCUSSION)

Behavior: Nose grows when he lies.

Treatment: Admit the truth and nose will return to normal.



READ AND REACT



NAME _____ DATE _____

CLINICAL TRIAL DISCUSSION QUESTIONS

A doctor is working on a behavioral intervention for people with noses that grow when they lie.

1. What are some Pros and Cons of using a written survey to learn about people with growing noses?

2. Below are some populations that you might send a survey to ask how the treatment is going. Describe one limitation of the populations you are surveying:
   a. Everyone who lives in the same state as the researcher.

   b. The entire roster of all patients enrolled in all clinical trials.

   c. People who have enrolled in another clinical trial for a different problem.

   d. All the patients that are seen at the clinic on a single day.

A population can be a group of people that belong because they have similar characteristics, or they can be in a population because they lack a specific feature.

When talking about populations in health care or statistics, there are terms for people or objects that are included when they should not be (False positives) and things that are included when they should not be (False negatives).

Fill out the answers to the questions on the Clinical Trial Discussion Questions sheet.

SANFORD RESEARCH CONNECTION

Clinical research is an integral part of what we do at Sanford Health. Our department has many skilled research project managers who work on various projects, including rare diseases, cancer, and cardiac applications. People who hold the vital role of research project managers connect the population of patients in our hospitals who need additional treatment options with doctors and companies with the expertise to make new medicines, devices, and procedures.