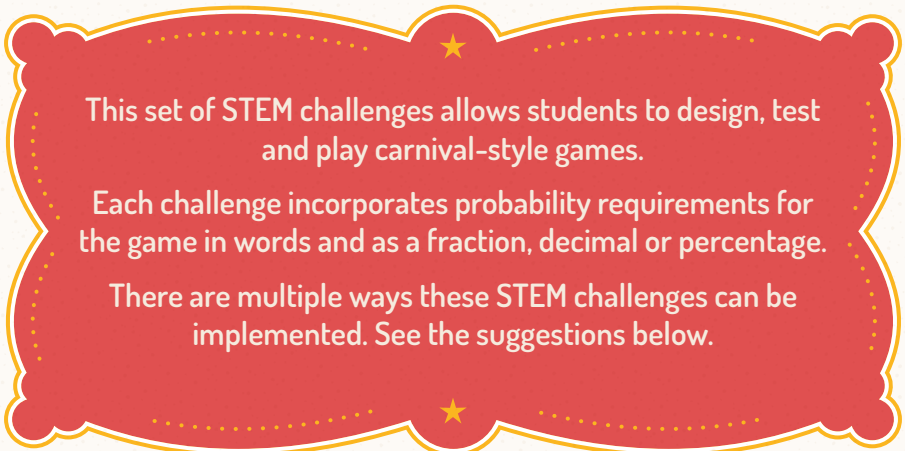




# CLASS CARNIVAL

## ★ Teacher Notes ★



This set of STEM challenges allows students to design, test and play carnival-style games.

Each challenge incorporates probability requirements for the game in words and as a fraction, decimal or percentage.

There are multiple ways these STEM challenges can be implemented. See the suggestions below.

### Design Process

Students should be familiar with the universal Design Process before beginning these STEM challenges.

- Divide the class into small groups, each working on their own version of the same game. Once complete, they compare their creations and note any differences in the outcomes of each game. Continue this process over multiple sessions until the class has a complete carnival with each type of game.
- Divide the class into small groups, each working on one of the different game types. Once complete, they compare their creation to other groups that made the same type of game.
- Monitor student progress as they create the games.
- Discuss the chance of winning each prize level with the students and check that the game matches the requirements.

### Class Carnival

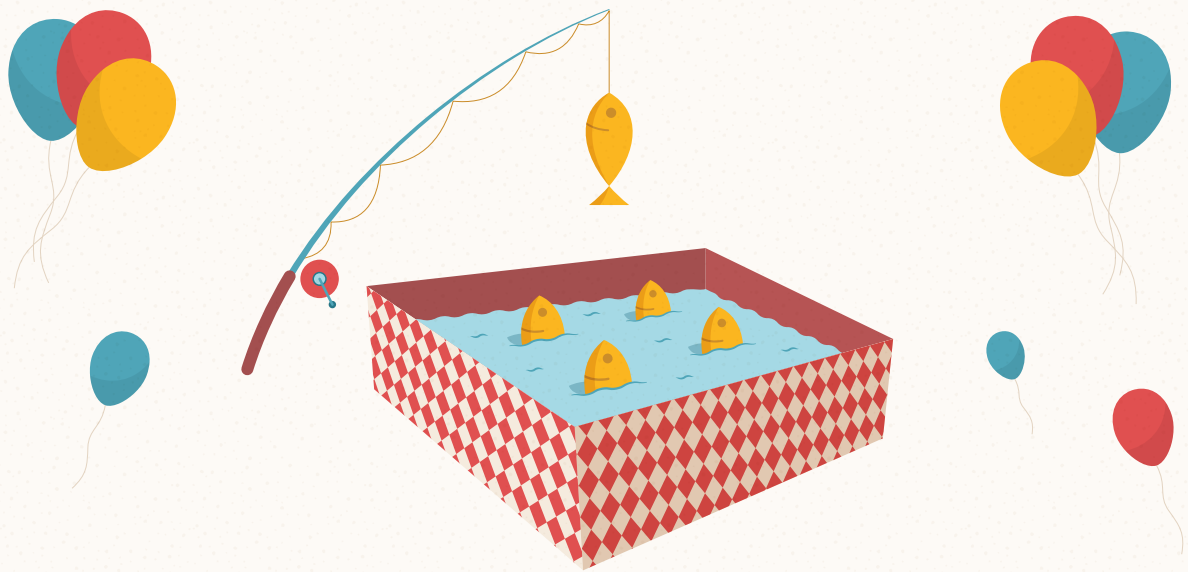
- Split the class so some students are running the games and some students are playing the games.
- Set rotation times so that all students have enough time to play each game and have a turn at running a game.
- Students win tokens and compare who has the most at the end of the session. Alternatively, allow students to 'cash in' their tokens for small prizes.

### Discussion

At the end of Class Carnival, have a discussion with students.

- What game was their favourite to play?
- What game was their favourite to run?
- What game won them the most tokens?
- How/Why is this different for each person?
- Was there a game that had a better chance of winning than the others?
- Who won the highest prize off that game?

# GONE FISHIN'



## Game Description

A fishing style game in which players use a fishing rod to pick up an object that reveals a prize.



## Suggested Materials

- cardboard
- magnets
- paperclips
- keyrings
- wire
- sticks
- string

## Suggested Procedure

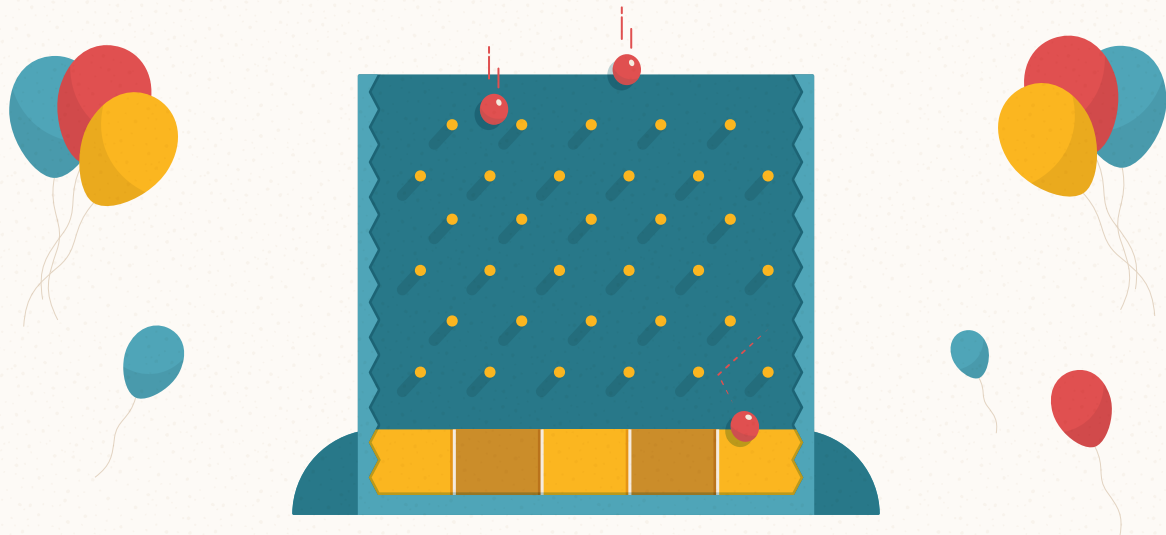
1. Create the container for the objects to be placed in.
2. Design the look of each object so they all look the same.
3. Create the 'fishing rod' players will use to pick up the objects.
4. Check the number of objects fits within the Game Requirements.
5. Create an enticing poster for the game, displaying its name and how to play.

## Game Requirements

The probability of winning each prize level must fit within the following probability descriptions.

Prize Level	Prize	Chance in Words	Chance in Percentages
Top Prize	3 tokens	Very unlikely	10% - 20%
Medium Prize	2 tokens	Possible	20% - 30%
Small Prize	1 token	Most likely	40% - 50%
No Prize	0 tokens	Unlikely	15% - 20%

# DROP THE BALL



## Game Description

A game where players drop a ball into an obstacle course. The ball makes its way through the course until it lands in a prize zone.

## Suggested Materials

- cardboard
- tape
- small marbles/table tennis balls
- paper cups

## Suggested Procedure

1. Make a symmetrical obstacle course for the ball to navigate.
2. Check there are multiple paths that the ball can take to reach the bottom.

3. Place prize zones at the bottom of the course.
4. Test the game to determine which prize zones are the most probable and which are the least probable.
5. Assign the prize amounts to each prize zone, so the game fits the requirements as close as possible.
6. Create an enticing poster for the game, displaying its name and how to play.

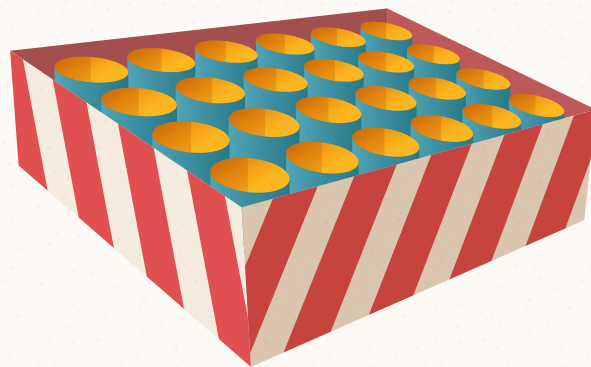
## Game Requirements

The probability of winning each prize level must fit within the following probability descriptions.



Prize Level	Prize	Chance in Words	Chance in Decimals
Top Prize	3 tokens	Least likely	0.1
Medium Prize	2 tokens	Unlikely	0.2
Small Prize	1 token	Most likely	0.7
No Prize	0 tokens	Impossible	0

# BALL TOSS



## Game Description

A game in which players throw a ball into a box that has cylindrical sections which indicate a prize.

## Suggested Materials

- cardboard box
- cardboard tubes
- paper
- table tennis balls/light foam balls/pompoms
- paper cups

## Suggested Procedure

1. Determine what type of ball will be used in the game.
2. Create cylindrical sections that are just slightly larger in diameter than the balls.

3. Fill a box with the cylinders.

4. Assign prize amounts to the cylinders, ensuring that they meet the game requirements.

5. Design an easy way to remove the balls and reset the game between players.

6. Create an enticing poster for the game, displaying its name and how to play.

## Game Requirements

The probability of winning each prize level must fit within the following probability descriptions.



Prize Level	Prize	Chance in Words	Chance in Fractions
Top Prize	3 tokens	Very Unlikely	1/10
Medium Prize	2 tokens	Possible	3/10
Small Prize	1 token	Even chance	1/2
No Prize	0 tokens	Very Unlikely	1/10



# SPIN A WINNER



## Game Description

A game in which players spin a wheel and win the prize that it lands on.

## Suggested Materials

- cardboard
- split pins
- paperclips
- wooden blocks

## Suggested Procedure

1. Explore ways to make a horizontal or vertical spinner, either spinning an arrow in the centre or spinning the wheel itself.

2. Create the wheel with the sections for prizes that match the Game Requirements below.
3. Test the wheel to ensure that it is not landing on the same space each time.
4. Create an enticing poster for the game, displaying its name and how to play.

## Game Requirements

The probability of winning each prize level must fit within the following probability descriptions.



Prize Level	Prize	Chance in Words	Chance in Fractions
Top Prize	5 tokens	Very Unlikely	1/16
Medium Prize	2 tokens	Possible	1/4
Small Prize	1 token	Most likely	1/2
No Prize	0 tokens	Unlikely	3/16