MATH CAREER ADVENTURES

# Game Designer: Introduction to Probability

## Adventure Description:

In this adventure, students will think like a game designer and use probability to determine the chances of winning prizes on a new game show!

## Activity

### Step 1: Background Information on Game Designers and Probability (5 minutes)

- Show Video: Introduction to Probability.
- Remind students that game designers create new games for game shows, carnivals, and apps. As a class, discuss the following reasons why a game designer would use probability when creating a new game.
- Show Handout: Information on Probability. As a class, review information about probability.

### Step 2: Activity Set Up (5 minutes)

- Explain to students that they will design a new game for a game show. Provide students with Handout: Steps to Design a Game and read through the handout as a class.
- Teacher note: students can work individually, in pairs, or in small groups.

### Step 3: Designing a Game (30+ minutes)

- As a class, read through step 1. Students will design a game where contestants fly a drone to a landing pad. There will be multiple pads that the drone can land on and only some of the landing pads will have prizes.
- Next, have students complete step 2. Students will decide how many landing pads there will be and which pads will have prizes.
    - Teacher note: remind students that when they add up the number of grand prize pads, small prize pads, and no prize pads, they need to equal the total number of pads in the game.
- After students complete step 2, they will move on to steps 3 and 4. They will calculate the probability that a contestant will win a prize. Then, they will build a model of the drone and landing pads.
- Students will need art supplies and building materials to build their models. Suggested supplies include: cardboard, construction paper, popsicle sticks, clay, and other recycled materials.

### Step 4: Calculating Probability of Winning Another Game (10 minutes)

- Divide students into pairs.
- Explain to students that they will switch games with another student in the class. Then, they will calculate the probability of winning a prize. Provide students with Handout: Calculating Probability.

**Please contact Allison Bischoff, Director of Customer Service, at allison@rozzylearningcompany.com or 314-272-2560 with questions.**

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**Step 5: Class Discussion (5 minutes)**

- Have students volunteer to present their games to the class. They should explain the probability of winning a prize and what the prizes are. After each student presents, discuss the following:
  - Which of the games that were presented would you prefer to play and why? (answers might focus on available prizes or probability of winning a prize)
  - Why might someone choose to play a game with a very low probability of winning over a game with a higher probability of winning? (the prizes in the lower probability game might be worth more)
  - What are some of the pros and cons of a high risk, high reward game? (e.g., a game that has amazing prizes, but very low chance of winning) What about for a low risk, low reward game? (e.g., a game that has ok prizes, but a high chance of winning)
  - If you added more launch pads without prizes to your game, how would that change someone's probability of winning the game?

## Marterials List

### Provided online:

- Video: Introduction to Probability
- Handout: Information on Probability
- Handout: Steps to Design a Game
- Handout: Calculating Probability

### Not provided:

- Art Supplies and Building Materials

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