Is It Fair?

**NCTM STANDARDS**
- Understand and apply basic concepts of probability.
- Develop and evaluate mathematical arguments and proofs.
- Communicate mathematical thinking coherently and clearly to peers, teachers, and others.
- Use the language of mathematics to express mathematical ideas precisely.
- Create and use representations to organize, record, and communicate mathematical ideas.

**BENCHMARKS**
- Describe events as likely or unlikely and discuss the degree of likelihood using words such as certain, equally likely, and impossible.

**Performance Assessment Task**

The RAM company, which specializes in super-fun games, is looking for games designed by kids to sell to other kids. Create your own game, and then test it to make sure it’s fair. Follow these steps:

- Think of a game you could invent that uses dice, a spinner, tiles, or cards.
- Fill out the attached game worksheet. Spelling, capital letters, and periods do count! Make sure your rules are clearly explained. Your explanation about why your game is fair or unfair should contain at least four math words.
- Design your game board. Neatness and color are important!

**Enabling Skills**
- Thinking of a game you want to design
- Understanding what makes a game fair or unfair
- Using probability words to explain why game is fair or unfair
- Checking spelling, capital letters, and periods
- Designing a neat, colorful, and creative game board
# RUBRIC SCORING GUIDE: Is It Fair?

## Partially Proficient

### In Progress
- A kid would not pick this as a game to play.
- There’s no color, and it’s messy.

### Basic
- A kid would play the game if you asked him to.
- The board doesn’t have much color.
- The board doesn’t draw players into the game.

## Proficient

- A kid would want to play this game.
- The board is colorful and neatly done.

## Advanced
- A kid would be eager to play this game.
- It is colorful, creative, and neatly done.
- Has title of game on the board.

## Explanation

- No math language was used.
- At least 2 math words were appropriately used.
- At least 3 math words were appropriately used.
- At least 4 math words were appropriately used.

## Directions

- It’s not clear how to play this game.
- Explanation is clearly clear.
- Explanation is clear.
- Detailed explanation of how to play the game.
- One could begin playing after having two or more questions answered.
- One could begin playing after having one question answered.
- One could begin playing without any questions.

## Conventions

- Numerous errors in spelling, capitalization, grammar or punctuation.
- Worksheet is difficult to read.
- There are several errors in spelling, capitalization, grammar, or punctuation. Worksheet is readable.
- There are a few errors in spelling, capitalization, grammar, and punctuation. Errors don’t take away from the worksheet.
- There aren’t any errors in spelling, capitalization, grammar, or punctuation.
- It is easy to read.
**IS IT FAIR?**

◆ **Advanced**

Aaron's game board is clearly designed and colorfully done. Many students enjoyed playing his game. His directions are detailed and easy to follow. His explanation of whether his game is fair is complete and uses at least four math words, and his overall conventions are strong.

◆ **Proficient**

Alex's work scores in the Proficient range. Although he uses some color, his board wasn't as inviting as Aaron's board. He uses three math words in his explanation, and most students and the teacher had to ask one question prior to beginning to play his game. The most common questions were, “Do I roll one die or two?” and “Do I roll the dice to play the game?” These details are not clearly spelled out in his directions. His spelling, capital letters, and periods are strong; however, he has one grammatical error and he wrote the word *that* twice in a row on his directions, an editing error. This assessment scored entirely in the Proficient range.
Is It Fair?
A Look at Probability

Invent a Game Worksheet

Name of game: Pick a tile
Authors: Aaron

Number of players: 2-4

Materials needed: a brown paper bag and 3 red tiles, 5 blue tiles, and 2 yellow tiles, a game board, and a different color tile for each player.

Rules for play:
First you put all of the tiles in a bag.
Then you take turns drawing a tile out of the bag. If you draw a tile, you put it back in and shake the bag up. If you draw a red tile, you move 5 spaces, a blue tile and you move 1 space, or a yellow tile and you move 10 spaces.

This game is yes or no because everyone has the same chance of drawing any tile because you put the tile back in the bag when you’re done drawing it. There is a 50-50 chance of drawing a blue or a yellow, but you don’t have an equally likely chance of getting red because there are less red than blue and yellow.
Is It Fair?
A Look at Probability
Invent a Game Worksheet

Name of game  get to the finish
Authors Alex M.

Number of players 2-4
Materials needed 2 dice, game pieces as in colored tiles, game board

Rules for play Roll the dice, whoever gets the highest number goes first. If you land on a spot that the color is red, you move ahead 5 spaces. But if you get a two on the dice or land on a place that is red, you lose a turn. If you land on a space that says go back to start you have to go back to the start. The last thing who ever gets to the finish wins.

This game is ☐ fair ☐ unfair because There is more chances to get lose a turn then there is go ahead spaces so that is just unfair.

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Is It Fair?

Name of Game ____________________________________________________________

Designed by: ____________________________________________________________

Number of Players: ______________________

Materials Needed: ________________________________________________________

______________________________________________________________________

Rules: ________________________________________________________________

______________________________________________________________________

______________________________________________________________________

______________________________________________________________________

Is your game fair or unfair? On the lines below tell what type of game you developed and WHY! Be sure to include math words in your explanation.

______________________________________________________________________

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