

#### **Curriculum topics:**

- Fractions
- Addition
- Subtraction
- Equivalent parts
- Substitution
- Estimation

#### Subject: Math

#### Grade range: 2 – 8

# **FRACK JACK**

### A hands-on way to learn fractions



Games are wonderful tools for teaching and motivating students! *Frack Jack* helps students of all ages master equivalent fractions and become skilled at estimating what portion of a circle is filled by any collection of fractional wedges.



Who we are:

Resource Area for Teaching (RAFT) helps educators transform the learning experience through affordable "hands-on" activities that engage students and inspire the joy and discovery of learning.

For more ideas and to see RAFT Locations

www.raft.net/visit-raft-locations

# **Materials required**

### (if using the RAFT Kit)

- Pre-cut fraction wedges
- Pre-printed fraction cards

### (if creating your own set)

- Flat, easily-cut material for fraction wedges (use colorful file folders, poster board, cardstock, magnet sheets, etc.)
- Circle Base 9 cm (3.5") in diameter (copy the paper version on page 5 or 6, or create your own using cardstock).

## How to build it

If using the RAFT Kit, skip to Step 3.



To make fraction wedges:

Cut 9 cm (3.5") circles from the selected material (colorful file folders, poster boards, cardstock, magnet sheets, etc.). Use circle template on page 6 as a guide. Cut one circle in half, one in thirds, and the rest as follows: 1/4, 1/5, 1/6, 1/8, 1/10, and 1/12. Other fractions, decimals, and percents can also be used. Label each wedge with its fractional equivalent. Templates for the wedges can be found at http://www.raft.net/raft-idea?isid=67.

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To make fraction cards:

Place a fractional value on each of 40 cards using printed labels or a permanent marker. Follow these guidelines:

- Use fractions that are less than 1
- Use the same denominators that were used for the wedges
- Create a large number of small fractions (1/10, 2/12, etc.)
- Create a <u>small</u> number of <u>larger</u> fractions (1/2, 4/10, etc.) which should all be less than or equal to 1/2

Suggested values for the cards can be found at <u>http://www.raft.net/raft-idea?isid=67</u>.

3

Copy the paper Circle Base provided on page 6, or draw a 9 cm (3.5") diameter circle on a piece of cardstock. **One Circle Base is needed for each player.** 

Optional - to hold the wedges in position during the game, create a frame by cutting a circular hole in a thick material (such as matte board) and placing the empty frame on top of the Circle Base. See page 5 for frame template.

- Circle Base 9 cm (3.5") in diameter (copy the paper version on page 5 or 6, or create your own using cardstock).
- 40 blank index cards
- Permanent marker
- Optional: Blank stickers

# Playing the game (2-4 players per set)

Object of the Game:

Frack Jack is similar to the popular card game, Blackjack. The object is to create a full circle of fraction wedges (a "**Frack Jack**"). The winner is the player whose fractions add up to a number that is closest to 1 (but not greater than 1). It sounds easy, but watch out: Players who get <u>more</u> than a full circle "**Go Bust**" and are out of the game!

*Educator tip:* Before introducing younger children to the rules (below), encourage them to simply play with the wedges and see what fractional relationships they discover on their own.

- Each player starts with an uncovered Circle Base. The available fraction wedges are placed within easy reach.
- 5 Shuffle the cards and place the deck face down within easy reach of all players.
- Bach player draws one card and places it face up near his or her Circle Base. Each player then takes fraction wedge(s) from available wedges equivalent to the fraction on the card.

**Equivalent fractions:** Players may notice that 2/8 is the same as 1/4 (for example). They can substitute two 1/8 wedges if they like. The selected wedges are arranged neatly inside the player's Circle Base for all to see.

- As noted in the "Object of the Game" section, a player "**Goes Bust**" if their wedges fill more than one whole circle (the sum of their fractions is greater than 1).
- 5 After the first round is completed, each player takes a turn as follows:
  - If the player thinks that taking a card may cause them to go Bust, they say "**Stick**" and play moves to the next player.
  - If the player thinks more wedges can be added to their circle without going Bust, they say, "**Hit me**". The player is then dealt (or takes) a card from the deck and adds the matching fraction wedge(s) to their Circle Base.
- 6 Play continues until all remaining players (who have not gone Bust) have decided to Stick.
- 7 The winner is the player whose combined fraction wedges come closest to covering the whole circle without going "Bust". An exact score of 1 (one whole circle) is a "**Frack Jack**".

### The math content in the activity

Playing Frack Jack can help learners to:

- Anticipate the relative size of a fraction when seeing the written form.
- Understand fractional equivalents (2/4 = 1/2).
- Understand that 1/3 is larger than 1/12, etc.
- Estimate when to stop by adding up parts to get close to one whole without going over.
- Understand when to swap equivalent parts

### Curriculum Standards:

Understand and compare fractions (Common Core Math Standards: Number & Operations - Fractions, Grade 3, 1, 2, & 3; Grade 4, 1, 2, & 3)

Fractions as parts of a whole (Common Core Math Standards: Grade 3, Geometry, 2)

Add and Subtract fractions with unlike denominators (Common Core Math Standards: Grade 5, Number & Operations -Fractions, 1)

### Learn more

Extend this activity with the following suggestions:

- Post a fraction vocabulary sheet on the board and review vocabulary with the students prior to the activity.
- Give each player only two cards, and have the group of 2-4 playing together determine which player has come the closest to one whole without going over.
- Create a new set of cards that include percentages and/or decimal values in addition to fractions. Play Frack Jack as before.
- Start out with several circular wedges formed into one complete circle. Take a fraction card (or a percent or decimal card) on a turn and remove that portion or equivalent parts of the whole circle to match the number on the card. Keep playing. The first to remove all wedges of the complete circle by an exact number of equivalent parts is the winner.
- To use this game in a different way, have a group of players draw one card. Challenge each player to create as many equivalent representations of the fraction as possible.

#### Related activities: See RAFT Idea Sheets:

Flip Over Fractions – http://www.raft.net/ideas/Flip over Fractions.pdf

The Fraction Action Game! – http://www.raft.net/ideas/Fraction Action Game.pdf

Fraction Action Plus – http://www.raft.net/ideas/Fraction Action Plus.pdf

#### Fraction Race! –

http://www.raft.net/ideas/Fraction Race.pdf

#### Match My Part -

http://www.raft.net/ideas/Match My Part.pdf

### Resources

Visit <u>www.raft.net/raft-idea?isid=67</u> for "how-to" video demos & more ideas!

See these websites for more information on the following topics:

- Fraction lessons <u>http://www.instructorweb.com/basicskills/fractions.asp</u>
- Equivalent fraction online activity –
  <u>http://illuminations.nctm.org/ActivityDetail.aspx?ID=80</u>
- Fraction games <u>http://www.learn-with-math-games.com/fraction-games.html</u>
- Videos and exercises on fractions from the Khan Academy -https://www.khanacademy.org/math/arithmetic/fractions

Additional standards at: http://www.raft.net/raftidea?isid=67





