



Fractions - Area & Linear 2.1.7

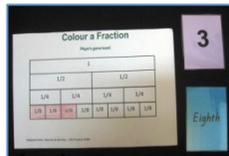
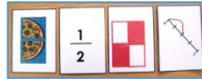
Word Wall: numbers, fractions, area, same as, not the same as, part, whole, half, quarters, eighths

Introduction

Students will explore halves, quarters and eighths using linear and area models, comparing number of parts to the size of a fraction.

Resources

- Large paper circles
- Pens and scissors
- Awesome Foursome fraction race
- Colour a fraction game: $1/8$ $1/4$ $1/2$
- Fraction equivalence cards: $1/2$ $1/4$
- Early FISH Kit



Time / Classroom Organisation

Each part of the activity process may be introduced in a whole group or small group as a 20-30 minute hands-on focused teaching and learning event. Repeat this experience allowing for experimentation using a variety of materials including area (pizza, paper circles), and linear (string, strips of paper).

Australian Curriculum

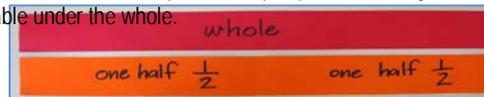
Year level: Two

ACMNA033 Recognise and interpret common uses of halves, quarters and eighths of shapes and collections (ACMNA033)

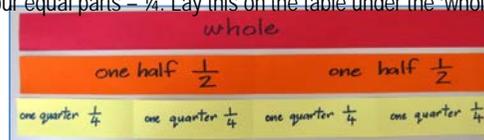


Activity Process – Fractions – linear

1. Give each student four identical lengths of streamer. Lay the streamers on the table and establish that they are the same length.
2. Each student takes one of the streamers and writes *one whole* – 1 on the streamer.
3. Take a second streamer and ask the students to fold this streamer in half. Check that the two lengths are exactly the same length. Write *one half* on each piece. As students write this as a number – *1 part of 2 equal parts* – $1/2$. Lay this on the table under the whole.



4. Take the third streamer. Ask the students: *If we wanted to share this with four people, what would we need to do?* Fold in half, and then half again. Ask: *What would we call this part of the whole/fraction?* One quarter. Write as a number – one part of four equal parts – $1/4$. Lay this on the table under the 'whole'.



5. Take the fourth streamer. Repeat the above process for eighths. Lay this on the table under the 'whole'.
6. Allow students to explore and investigate the resource they have made. *How many ways can you make a whole? a half? How could you write three quarters as a number?*

Source: SES project. 2008.



Activity Process – Fractions – area

1. Discuss fractions as meaning an equal part of something. Use some real life examples like: pizza, loaf of bread, chocolate bar. Ask: *How would we share these equally?* Act out student's suggestions.
2. Give each student four paper circle to represent their own pizzas. Say: *This is a whole pizza.* Write *one whole* on the paper circle. Say: *Another way I can write one whole is to use the number 1.* Ask students write this on their own pizza.
3. Take another paper circle. Say: *Now I'm going to share this pizza amongst two people.* Fold and cut the circle in half. Write *one half* on each part. As you write $1/2$, explain that this is 1 part of 2 equal parts. Put the two parts back together to rebuild one whole pizza.
4. Take another paper circle. Say: *I'm going to share this pizza amongst four people.* How will I fold the paper? Fold in half and fold in half again. Open up the circle and count how many equal parts you can see. Write *one quarter* on each part. As you write $1/4$, explain that this is 1 part of 4 equal parts. The students repeat this with their own pizzas. Put the four parts back together to rebuild one whole.
5. Repeat the process for eighths. Say: *Now I want to share this last pizza amongst eight people.* How do you think I will do this? Fold the circle once to get halves, again to get quarters, and again to get eighths. Open up the circle and count how many equal parts you can see. Write *one eighth* on each part. As you write $1/8$, explain that this is 1 part of 8 equal parts.
6. Compare the size of the pieces. *Which is the biggest/smallest? Is an $1/8$ bigger or smaller than a $1/4$? If 4 people were sharing the pizza, what fraction would each person get?*



Catholic Education
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Learning with Faith and Vision

Variations and Extensions

1. Play with linear and area models.

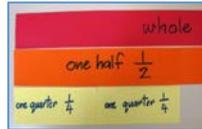
Resources: Linear and Area model of fractions made in the activity process.

Allow students to explore the materials made throughout the activity process and record observations made.

Challenge students with questions:

How many quarters fit into one half?

If 1 slice is 1/8 of the pizza, what fraction would 5 pieces be?



2. Awesome foursome race

Resources: Awesome Foursome fraction race

Students roll a dice and move forward by $\frac{1}{4}$, $\frac{1}{2}$ or $\frac{3}{4}$. If a student lands on a sun symbol, draw a playing card from the pile and move forwards and backwards $\frac{1}{2}$, $\frac{1}{4}$ or $\frac{3}{4}$.

Source: Warren & deVries, SES project. 2008.

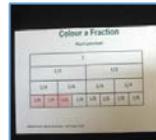


3. Colour a fraction

Resources: Colour a fraction game: $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$

Each student has a game board. One dice with Numbers 1, 1, 2, 2, 3, 4 and the other dice with Halves x1, quarters x2, eighths x3. Students can begin to strategise with equivalent fractions. The first to complete the game board is the winner.

Source: Warren & deVries, SES project. 2008.



4. Fly swatter fractions

Resources: Fraction equivalence cards: $\frac{1}{2}$, $\frac{1}{4}$

Each group has 1 caller and 4 players. Each player has a fly swatter. Place 5 fraction equivalence cards in a row. The caller calls out the name of one of the fractions. The first to swat the correct fraction takes the card. The caller replaces the card with a new card from the pack. The game continues for a set time or until all the cards have been used.

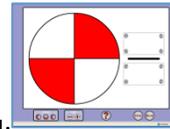
Each player records the number of cards they have won, and attempts to beat this score in the next game.

Source: Warren & deVries, SES project. 2008.



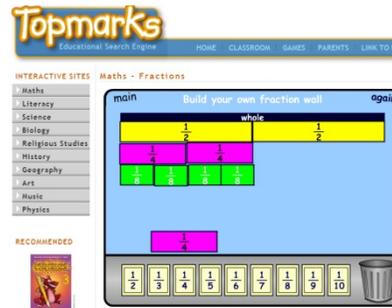
<http://www.education.com/game/addition-pizza-1-10/>

Fraction maker:



Build your own fraction wall:

<http://www.numeracyhelper.com/fractionwalls/>



Contexts for learning

Play:

Play concentration or snap with the Fraction equivalence cards: $\frac{1}{2}$, $\frac{1}{4}$

Real life experience:

When sharing out equipment in the classroom, convert the sharing to a fraction, for example: 1 pizza shared among 8 children is the same as $\frac{1}{8}$ or one eighth.

Investigation:

Working in pairs, each group pulls one of the Fraction equivalence cards: $\frac{1}{2}$, $\frac{1}{4}$ and represents this fraction using wool, paper strips, paper circles, paper squares and a collection of counters.

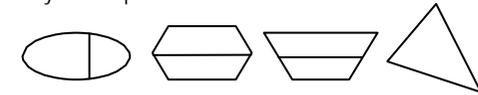
Routines and Transitions:

Place a Fraction equivalence cards: $\frac{1}{2}$, $\frac{1}{4}$ area card in each pocket of a jumbo pocket dice. Students roll the dice, name the fraction, and write the fraction on a whiteboard.



Assessment

Identify the shapes that have been divided into halves:



Use the Fraction equivalence cards: $\frac{1}{2}$, $\frac{1}{4}$. Ask students to identify the fraction represented by the card, explaining their reasoning.

Source: E deVries 2009.



Background Reading

"The idea that things can be partitioned or split into parts of equal size underpins the fraction concept. Students need extensive experience in splitting a diverse range of discrete and continuous wholes into equal-size parts. Collections (discrete quantities) can be shared into equal parts by dealing out or distributing, while objects can be shared into equal parts by cutting, folding, drawing, pouring and weighing. ... Students should become flexible in partitioning and develop the following ideas.

Equal parts need not look alike, but they must have the same size or amount of the relevant quantity.

When splitting a whole into equal parts, the whole should be completely used up.

Regardless of how we partition, the whole remains the same amount.

The more shares something is split into, the smaller each share is".

Source: First steps in Mathematics – Number – Understand Fractional Numbers, 2007. Rigby: Port Melbourne. p 104.

Year three NAPLAN Numeracy test links

2008 Question 23 – Identifies an area model representing one quarter.

2010 Question 3– Halves a small collection of objects

2009 Question 29 – Solves a capacity problem involving fractions

2009 Question 16 – Halves an even number of objects

Links to other MAG's

1.2.5 – Fractions – $\frac{1}{2}$ - Area

1.3.7 – Fractions – $\frac{1}{2}$ - Linear

1.4.7 – Fractions – $\frac{1}{2}$ - Collections

2.3.6 – Fractions – Collections