Munch and Crunch

A book about doubling and halving

Aim

Munch and Crunch introduces the relationship between doubling and halving. This investigation is then extended through the use of concrete and pictorial materials to double and halve groups.

These whole-class activities provide students with the opportunity to:

- listen to a story about doubling and halving
- use materials to act out the story
- use the *Teaching Tool* to act out the story
- use materials to explore the relationship between doubling and halving
- use the *Teaching Tool* to explore the relationship between doubling and halving
- make a function machine to double and halve numbers

Activities

1. Listening to the story
2. Making paint prints
3. Using materials to act out the story
4. Using the teaching tool to act out the story
5. Using the teaching tool to double
6. Doubling and halving patterns
7. Drawing dominoes to act out the story
8. Using the teaching tool to double and halve
9. Writing doubling and halving number facts
10. Making a doubling and halving machine

ORIGO Big Books FOR MATHEMATICS

I. Listening to the story

Resources

- *Munch and Crunch*

Activity

Show the cover of *Munch and Crunch* to the students and read the title aloud. Encourage volunteers to predict what they think the story might be about. First, read the story in its entirety. Do not stop to discuss the pictures. After reading the story ask, **What happened in the story? What did you see in each of the pictures?** Encourage students to explain that the numbers are being halved. Read the story again and at the conclusion of each double-page spread ask, **What number has been halved?** From pages 12 onward have students predict the number of items that will be munched. Ask students to explain their thinking.

2. Making paint prints

Resources

- Art paper
- Paints
- Paintbrushes

Preparation

Each group of students will need different colour paints. Each student will need a sheet of art paper and a paintbrush.

Activity

Have each student fold a piece of paper in half lengthways. Show a folded sheet of paper and ask, **How many halves can you see? Is each half the same size?** Bring out the fact that one-half is one of two equal parts. Next, ask the students to put several small blobs of paint on one-half of their sheet of paper. Ensure that the students identify the number of blobs they have used. Have them fold their sheet of paper back in half. Ask, **What do you think will happen when we unfold the paper?** Unfold the paper and ask, **What do you see?** Select a volunteer to explain that the blobs of paint that were on one-half of the paper have now doubled. Have each student identify their number that has doubled and the total. Repeat the activity to make different doubles.

3. Using materials to act out the story

Resources

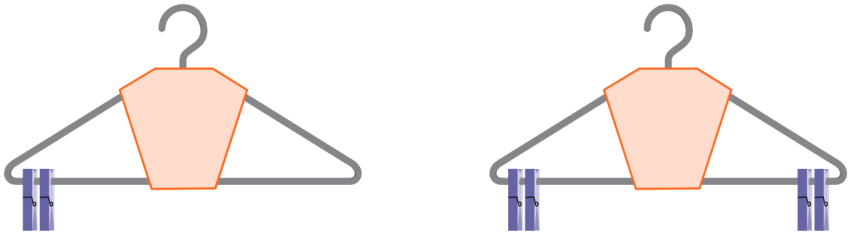
- *Munch and Crunch*
- Support 1 – see attached
- 8 wire coathangers
- Clothes pegs
- Large permanent marker

Preparation

Print eight copies of Support 1 and cut out the coathanger collars. Attach each collar to a wire coathanger.

Activity

Read pages 2–3 of *Munch and Crunch* and ask a volunteer to identify the number of items that are remaining. Refer to these items as one-half of the double. To represent this number have the volunteer clip two clothes pegs onto one side of the coathanger. Next, select a volunteer to identify the number of items that have been munched and crunched. Have the student clip two pegs onto the other side of the coathanger to represent this number.



Point to the number of pegs on each side of the coathanger and ask, **What number is being doubled? How many pegs are there in total? What is double 2?** Have the students say together, 'Double 2 is 4.' Use the marker to write ***Double 2 is 4*** on the collar. Repeat for the remaining pages of *Munch and Crunch*. The coathangers can then be hung around the classroom.

4. Using the teaching tool to act out the story

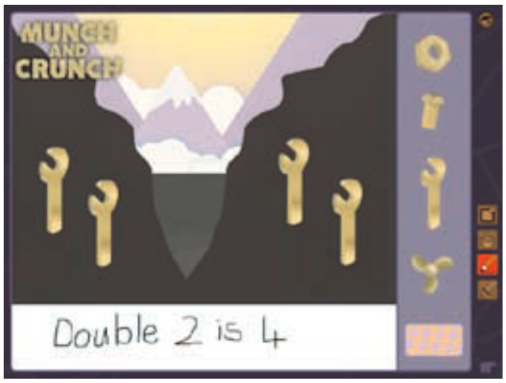
Resources

- *Teaching Tool*
- *Munch and Crunch*

Activity

Ensure that all the students can see the *Teaching Tool*. Read pages 2–3 of *Munch and Crunch*. Select a volunteer to model the situation on the *Teaching Tool*. Have the volunteer drag two spanners on the left side of the work area.

Refer to this number as one-half of the double. Next, select a volunteer to identify the number of items that have been munched away. Have the volunteer represent this number by dragging another two spanners onto the right side of the work area. Ask, **What number is being doubled? How many spanners are there in total?** Write ***Double 2 is 4*** in the white panel at the base of the screen. Repeat for the remaining pages of *Munch and Crunch*.



5. Using the teaching tool to double

Resources

- *Teaching Tool*

Activity

Ensure that all the students can see the *Teaching Tool*. Invite a volunteer to make one-half of a double by dragging several tap handles onto the left side of the work area. Have the remaining students identify the number of tap handles that have been dragged onto the work area. Then ask, **Who thinks that they can double this number?** Invite a volunteer to drag the matching number of tap handles to the right side of the work area. Ask the student to identify the double and write it in the white panel at the base of the screen, for example *Double 4*. Then ask, **How many tap handles are there in total?** Nominate a student to say this number and complete the double sentence in the writing panel, for example ***Double 4 is 8***. Repeat the activity for other numbers as time allows.

6. Doubling and halving patterns

Resources

- Art paper
- Crayons or pencils

Preparation

Each student will need a sheet of art paper and some crayons or pencils.

Activity

Draw a doubling pattern on the board. Work with the students to write the matching number below each part. For example:

1 2 4 8

Encourage students to suggest what the next number in the pattern will be. Invite a volunteer to draw and label the next part. Repeat for two more parts and then repeat for different doubling patterns. To extend the activity, draw a pattern that decreases by half for each part. Again, work with the students to write the matching number for each part and then extend the pattern for as many parts as possible. Afterward, challenge the students to create their owndoubling or halving pattern and present it to the class.

7. Drawing dominoes to act out the story

Resources

- *Munch and Crunch*
- Support 2 – see attached

Preparation

Print a copy of Support 2 for each student.

Activity

Read *Munch and Crunch*. At the conclusion of each picture spread ask, **How many spanners are in the half can you see?** Have the students draw dots on one end of the first domino on their sheet to show the half they can see. Ask, **If half of the double is 2, how many are in the other half?** Ask the students to draw the dots on the other end to show the other half. Ask, **What is the total?** Have the students complete the doubling and halving sentences to match the domino picture. Repeat for each doubling and halving scenario in the story.

8. Using the teaching tool to make and halve doubles

Resources

- *Teaching Tool*

Activity

Ensure that all the students can see the *Teaching Tool*. Invite a volunteer to show a double on the *Teaching Tool* by dragging the same number of characters onto each side of the work area. Invite another student to say the double and then write it in the white panel at the base of the screen, for example ***Double 4 is 8***. Then ask, **Who can halve this double?** Select a volunteer to halve the double by moving half the number of characters back to the tray. Have the remaining students count the number left. Ask, **What is half of 8?** Select a student to say this number and then write the halving sentence ***Half of 8 is 4*** in the white panel. Repeat for other doubles as time allows.

9. Writing doubling and halving number facts

Resources

- Counters

Preparation

Each pair of students will need 20 counters.

Activity

Ask the students to use their counters to help them write as many related doubling and halving facts as they can in the form:

Double 4 is 8.
Half of 8 is 4.

Afterward, invite each pair of students to share related doubling and halving facts and to describe how they figured them out.

10. Making a doubling and halving machine

Resources

- Support 3 – see attached
- Light card
- Shoebox
- Large permanent marker

Preparation

Print two copies of Support 3 onto light card and cut out the two sets of numeral cards. Cut a slot (large enough to fit a numeral card) in both ends of the shoebox. Write ***Double*** on one long side of the shoebox and ***Half*** on the other side. Place one set of numeral cards inside the box.

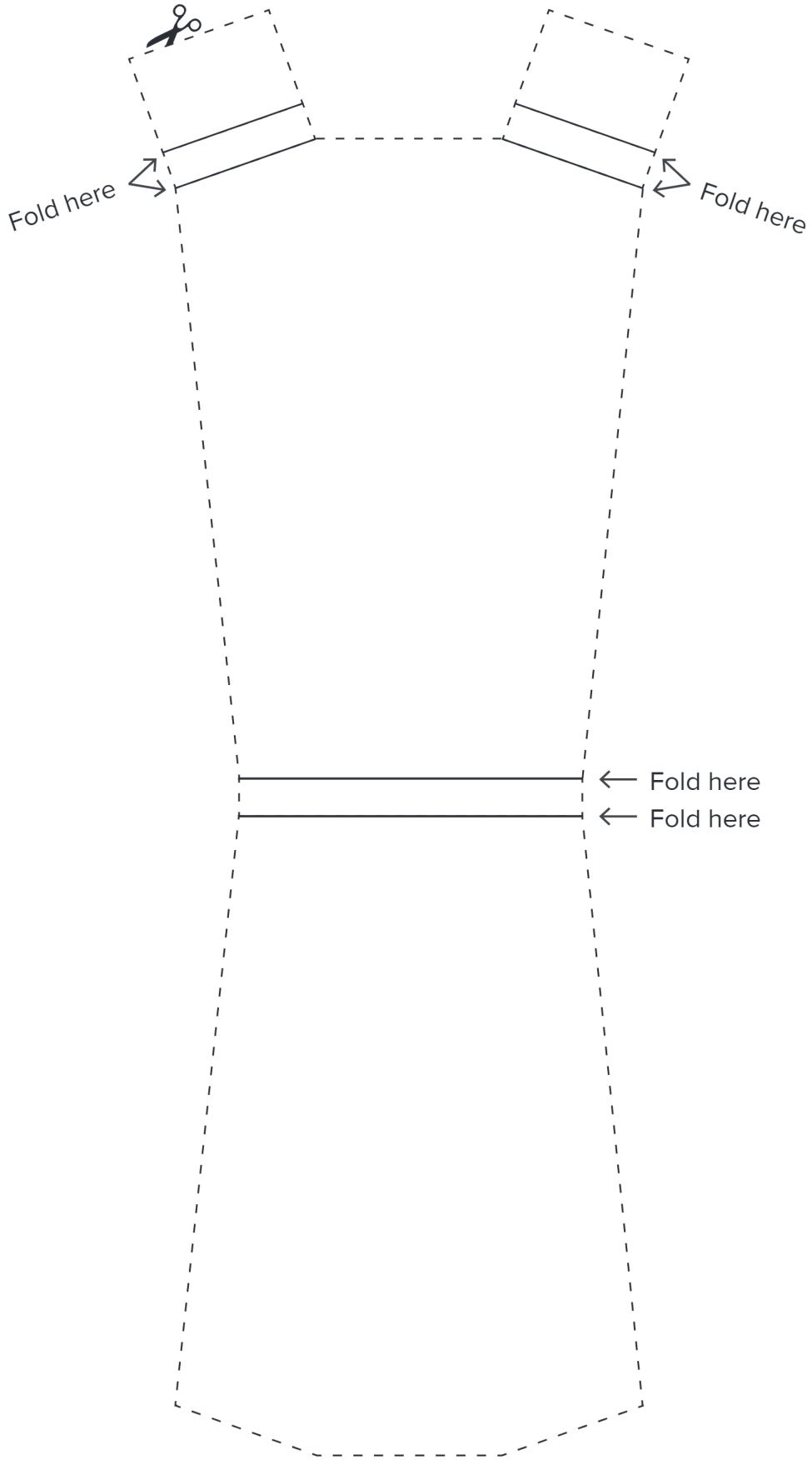
Activity

Show the students the shoebox and say, **This is a doubling and halving machine.** Show them the ***Double*** side and say, **When you put a number in the machine** (point to the slot on the students' left) **the machine will double the number.** Show them the ***Half*** side and say, **When you put a number in the machine** (point to the slot on the students' left) **the machine will halve the number.** Invite a volunteer to come to the front and act as the machine. Have this student hold the box so that the ***Double*** side is facing the remaining students. Distribute two of the remaining numeral cards (only use numbers from 1 to 10) to different students and have them, one at a time, show their card and then feed it into the appropriate slot.

The student who is acting as the machine then finds the corresponding double in the box and shows the class the numeral card. Have the seated students say the double, for example 'Double 4 is 8.' Repeat with different students acting as the machine and with different IN numbers. To vary the activity, show the ***Half*** side of the box and use the even numeral cards from 2 to 20. To extend the machine, show the ***Double*** side of the box and use the even numeral cards from 2 to 20. Ask for example, **If 14 comes out of the machine, what number went in?**

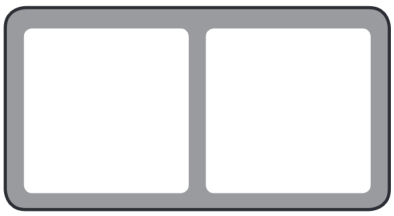
Coathanger Collar

Support I



Doubling and Halving

Support 2

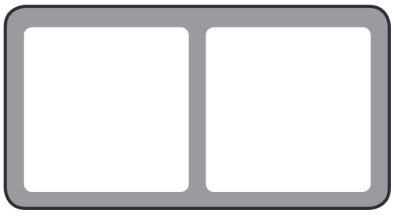


Double _____ is _____.

Half of _____ is _____.

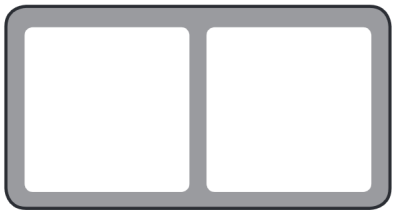
Double _____ is _____.

Half of _____ is _____.



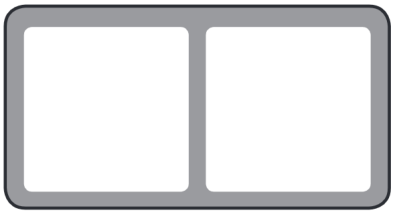
Double _____ is _____.

Half of _____ is _____.



Double _____ is _____.

Half of _____ is _____.



Double _____ is _____.

Half of _____ is _____.

Double _____ is _____.

Half of _____ is _____.

Numeral Cards 1–20

Support 3

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16
17	18	19	20