

# Non-stop Ninths

**You need**  a classmate  
 a calculator

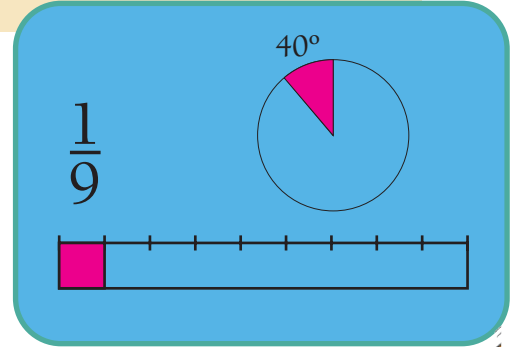
a copy of a decimat (see copymaster)  
 scissors

## Activity

Ese and Wiha are exploring different ways of showing  $\frac{1}{9}$ .

Ese knows that  $\frac{1}{9}$  is the answer to  $1 \div 9$ .

He enters  $1 \div 9$  on his calculator and gets **0.111111**



I wonder if the 1s keep going?

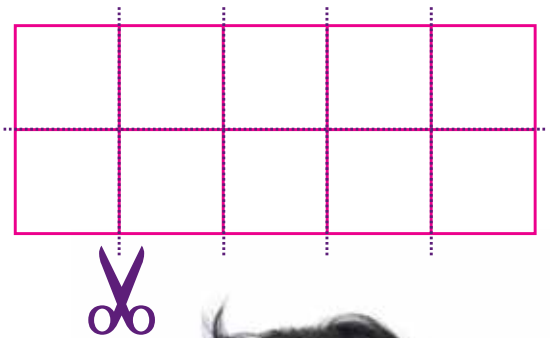
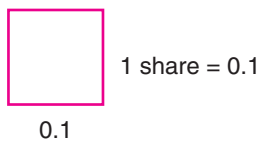


**1.** Ese and Wiha use a decimat to figure out why the calculator and long division answer to  $1 \div 9$  is  $0.1111 \dots$  (or  $0.\dot{1}$ ).

Use your copy of a decimat and work through the following steps.

### Step 1

Cut a decimat into ten pieces (tenths). (Each piece is 0.1)  
Share the pieces out into 9 "piles".  
(1 piece will be left over.)




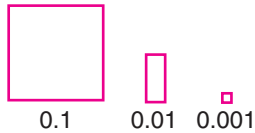
### Step 2

Cut the leftover piece into tenths. (Each piece is 0.01)  
Add 1 of these small pieces to each pile. (1 piece will be left over.)

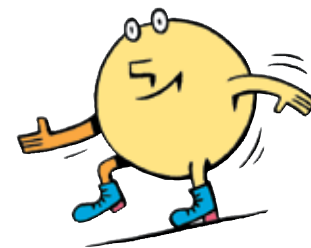
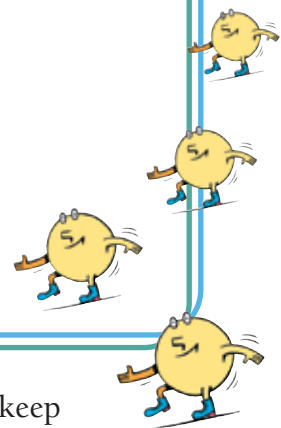


### Step 3

Cut the leftover piece into tenths. (Each piece is 0.001)   
Add 1 of these small pieces to each pile. (1 piece will be left over.)



$$1 \text{ share} = 0.1 + 0.01 + 0.001 \\ = 0.111$$



2.

Discuss with a classmate what would happen to the decimal if you were able to keep cutting and sharing the leftover piece in this way.

3.

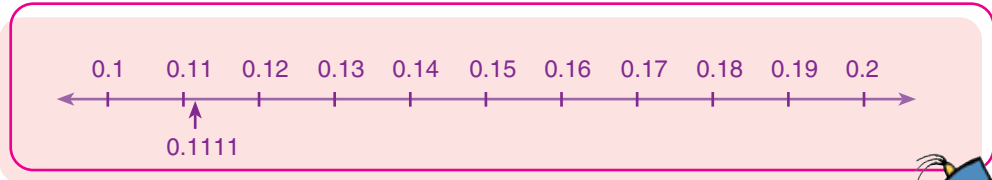
It would be tidier to round 0.1111 to just 2 decimal places.

**When a decimal goes on forever, it's called a recurring decimal.**

But which number is it closest to?



Ese and Wiha draw up a number line and show 0.1111 on it:



- Is 0.1111 closer to 0.11 or 0.12?
- Write  $\frac{1}{9}$  as a decimal to 2 decimal places.



4.

- Suppose a store took  $\frac{1}{9}$  off all their prices. Give the new price of items that normally cost:
 

i. \$2	ii. \$3	iii. \$4	iv. \$5
v. \$6	vi. \$7	vii. \$8	viii. \$9
- Use number lines to show the new prices for two of your answers.

