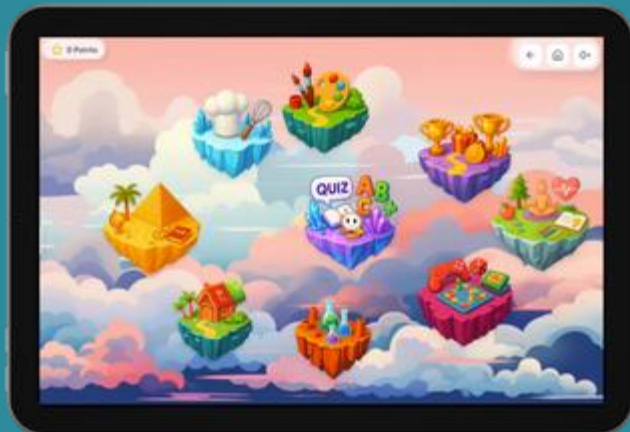




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Nifty Nines – Year 4

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NIFTY NINES

STRATEGY TOOLKIT

1. Spot the pattern

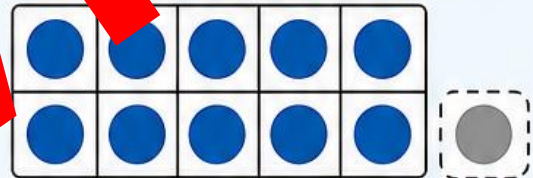
9, 18, 27, 36, 45, 54, 63, 72, 81, 90, 99, 108

The tens rise while the ones fall.



2. Use $10 \times$, then subtract a group

$$9 \times 6 = 60 - 6 = 54$$



3. Multiply around

$$9 \times 4 = 4 \times 9 = 36$$



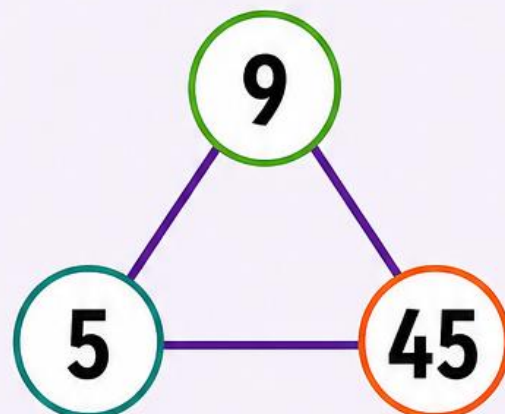
4. Build a fact family

$$9 \times 5 = 45$$

$$5 \times 9 = 45$$

$$45 \div 9 = 5$$

$$45 \div 5 = 9$$



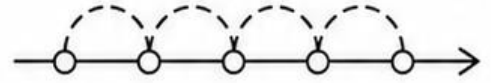
WORKSHEET 1: PATTERN DETECTIVE



Name: _____

Date: _____

A. Complete each pattern.



1. 9, 18, 27, ____, 45, ____, 63, 72, ____, 90

2. 18, 27, ____, 45, 54, ____, 72, ____, 90, 99

B. Use $10 \times$, then subtract one group.



3. $9 \times 6 = (10 \times 6) - 6 = \underline{\hspace{2cm}}$

4. $9 \times 8 = (10 \times 8) - 8 = \underline{\hspace{2cm}}$

5. $9 \times 11 = (10 \times 11) - 11 = \underline{\hspace{2cm}}$

C. What do you notice?



6. Explain how the tens and ones digits change across the $9 \times$ facts.

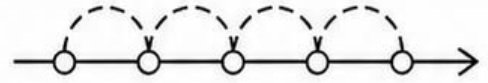
WORKSHEET 1: PATTERN DETECTIVE



Name: ANSWERS

Date: _____

A. Complete each pattern.



1. 9, 18, 27, 36, 45, 54, 63, 72, 81, 90

2. 18, 27, 36, 45, 54, 63, 72, 81, 90, 99

B. Use $10 \times$, then subtract one group.



3. $9 \times 6 = (10 \times 6) - 6 = \underline{54}$

4. $9 \times 8 = (10 \times 8) - 8 = \underline{72}$

5. $9 \times 11 = (10 \times 11) - 11 = \underline{99}$

C. What do you notice?



6. Explain how the tens and ones digits change across the $9 \times$ facts.

The tens digit increases by 1 while the ones digit decreases by 1.

WORKSHEET 2: MULTIPLY BY NINE

Name: _____

Date: _____

A. Solve.

1. $9 \times 1 = \underline{\quad}$

2. $9 \times 2 = \underline{\quad}$

3. $9 \times 3 = \underline{\quad}$

4. $9 \times 4 = \underline{\quad}$

5. $9 \times 5 = \underline{\quad}$

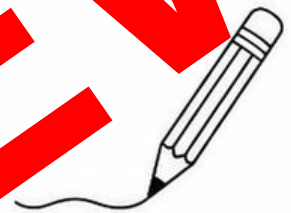
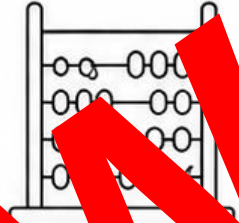
6. $6 \times 9 = \underline{\quad}$

7. $7 \times 9 = \underline{\quad}$

8. $8 \times 9 = \underline{\quad}$

9. $9 \times 9 = \underline{\quad}$

10. $12 \times 9 = \underline{\quad}$



B. Choose a strategy.

11. Solve 9×7 . Show what you know.

C. Apply your thinking.

12. A theatre has 8 rows with 9 seats in each row. How many seats are there altogether?

WORKSHEET 2: MULTIPLY BY NINE

Name: ANSWERS

Date: _____

A. Solve.

1. $9 \times 1 = \underline{9}$

2. $9 \times 2 = \underline{18}$

3. $9 \times 3 = \underline{27}$

4. $9 \times 4 = \underline{36}$

5. $9 \times 5 = \underline{45}$

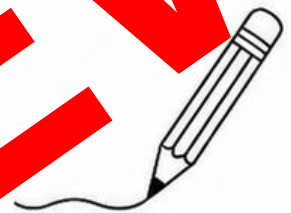
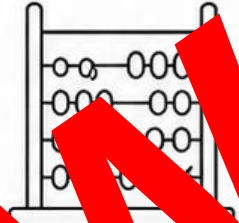
6. $6 \times 9 = \underline{54}$

7. $7 \times 9 = \underline{63}$

8. $8 \times 9 = \underline{72}$

9. $9 \times 9 = \underline{81}$

10. $12 \times 9 = \underline{108}$



B. Choose a strategy.

11. Solve 9×7 . Show what you know.

63; for example, $10 \times 7 = 70$, $70 - 7 = 63$.

C. Apply your thinking.

12. A theatre has 8 rows with 9 seats in each row. How many seats are there altogether?

72 seats; $8 \times 9 = 72$.

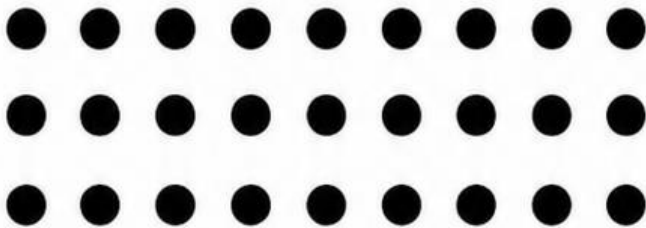
WORKSHEET 3: ARRAYS AND FACT FAMILIES

Name: _____

Date: _____

A. Read each array. Complete the fact family.

Array A: 3 rows of 9



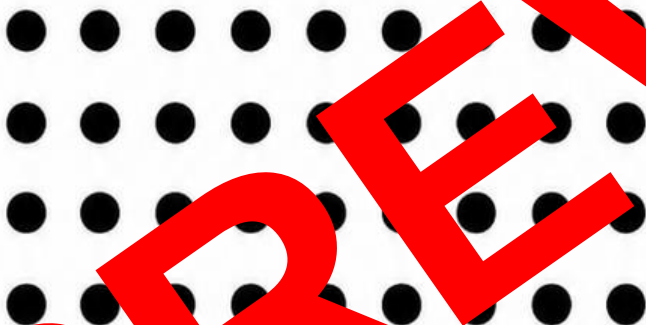
$3 \times 9 = \boxed{}$

$9 \times 3 = \boxed{}$

$27 \div 9 = \boxed{}$

$27 \div 3 = \boxed{}$

Array B: 4 rows of 9



$4 \times 9 = \boxed{}$

$9 \times 4 = \boxed{}$

$36 \div 9 = \boxed{}$

$36 \div 4 = \boxed{}$

Build a fact family.

Use 9, 8 and 72 to write two multiplication facts and two division facts.

$\boxed{} \times \boxed{} = \boxed{}$

$\boxed{} \times \boxed{} = \boxed{}$

$\boxed{} \div \boxed{} = \boxed{}$

$\boxed{} \div \boxed{} = \boxed{}$

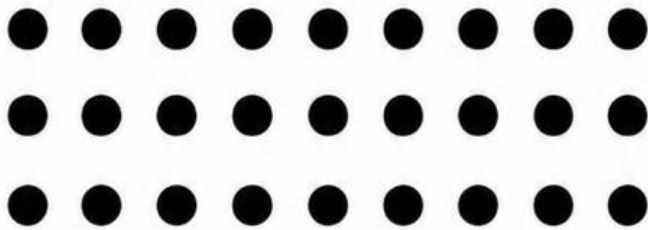
WORKSHEET 3: ARRAYS AND FACT FAMILIES

Name: **ANSWERS**

Date: _____

A. Read each array. Complete the fact family.

Array A: 3 rows of 9



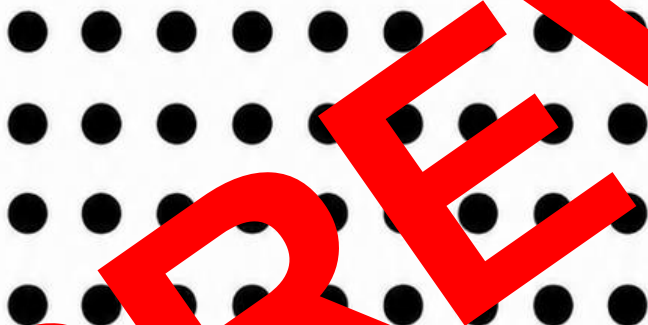
$3 \times 9 = \boxed{27}$

$9 \times 3 = \boxed{27}$

$27 \div 9 = \boxed{3}$

$27 \div 3 = \boxed{9}$

Array B: 4 rows of 9



$4 \times 9 = \boxed{36}$

$9 \times 4 = \boxed{36}$

$36 \div 9 = \boxed{4}$

$36 \div 4 = \boxed{9}$

Build a fact family.

Use 9, 8 and 72 to write two multiplication facts and two division facts.

$\boxed{9} \times \boxed{8} = \boxed{72}$

$\boxed{8} \times \boxed{9} = \boxed{72}$

$\boxed{72} \div \boxed{9} = \boxed{8}$

$\boxed{72} \div \boxed{8} = \boxed{9}$

WORKSHEET 4: DIVIDE BY NINE

Name: _____

Date: _____

A. Solve.

1. $72 \div 9 = \underline{\quad}$

2. $45 \div 9 = \underline{\quad}$

3. $81 \div 9 = \underline{\quad}$

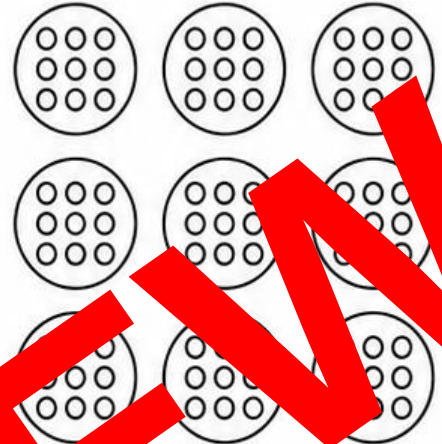
4. $108 \div 9 = \underline{\quad}$

5. $63 \div 9 = \underline{\quad}$

6. $36 \div 9 = \underline{\quad}$

7. $90 \div 9 = \underline{\quad}$

8. $54 \div 9 = \underline{\quad}$



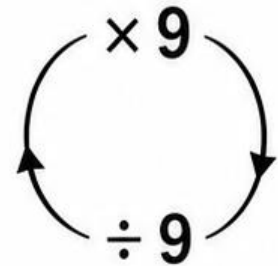
B. Use the inverse.

9. $9 \times \underline{\quad} = 63$

10. $7 \times 9 = \underline{\quad}$

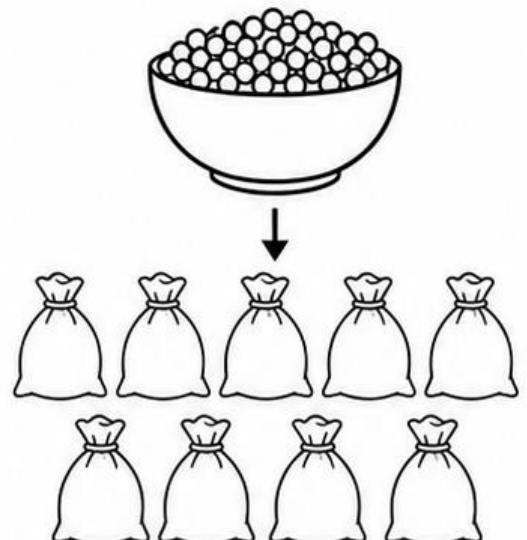
11. $\underline{\quad} \times 9 = \underline{\quad}$

12. $99 \div 9 = \underline{\quad}$



C. Apply your thinking.

13. Aisha shares 81 beads equally into 9 bags. How many beads are in each bag?



WORKSHEET 4: DIVIDE BY NINE

Name: ANSWERS

Date: _____

A. Solve.

1. $72 \div 9 = \underline{8}$

2. $45 \div 9 = \underline{5}$

3. $81 \div 9 = \underline{9}$

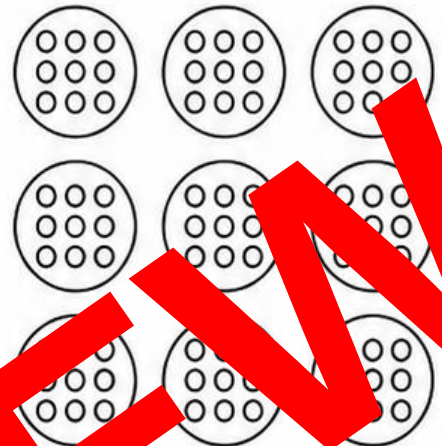
4. $108 \div 9 = \underline{12}$

5. $63 \div 9 = \underline{7}$

6. $36 \div 9 = \underline{4}$

7. $90 \div 9 = \underline{10}$

8. $54 \div 9 = \underline{6}$



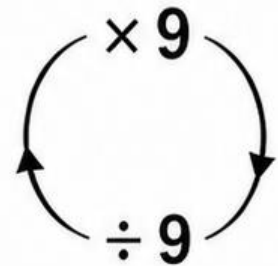
B. Use the inverse.

9. $9 \times \underline{7} = 63$

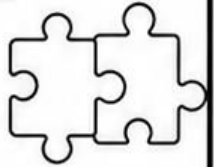
10. $7 \times 9 = \underline{63}$

11. $\underline{5} \times 9 = \underline{45}$

12. $99 \div 9 = \underline{11}$



WORKSHEET 5: MISSING NUMBER CHALLENGE



Name: _____

Date: _____

A. Find each missing number.

1. $9 \times \square = 72$

6. $\square \div 9 = 7$

2. $\square \times 9 = 45$

7. $54 \div \square = 6$

3. $63 \div 9 = \square$

8. $9 \times \square = 54$

4. $81 \div \square = 9$

9. $90 \div 9 = \square$

5. $9 \times \square = 108$

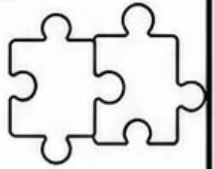
10. $9 \times \square = 27$

B. Explain your reasoning.

11. What number completes $54 \div \square = 9$? Explain how you know.



WORKSHEET 5: MISSING NUMBER CHALLENGE



Name: **ANSWERS**

Date: _____

A. Find each missing number.

1. $9 \times \boxed{8} = 72$

6. $\boxed{63} \div 9 = 7$

2. $\boxed{5} \times 9 = 45$

7. $54 \div \boxed{6} = 9$

3. $63 \div 9 = \boxed{7}$

8. $9 \times \boxed{9} = 81$

4. $81 \div \boxed{9} = 9$

9. $90 \div 9 = \boxed{10}$

5. $9 \times \boxed{12} = 108$

10. $9 \times \boxed{3} = 27$

B. Explain your reasoning.

11. What number completes $54 \div \boxed{6} = 9$? Explain how you know.



Because $6 \times 9 = 54$, so $54 \div 6 = 9$.

NIFTY NINES RACE

Players: 2–4

1. Place counters on START.
2. Take turns rolling a die and move.
3. Solve the fact on your space. A correct answer keeps your move. An incorrect answer moves you back one space.
4. First to FINISH wins.





NIFTY NINES RACE TASK CARDS



Cut out the cards. Draw a card, solve it, then check with a partner.


$$9 \times 6$$

Answer: _____


$$63 \div 9$$

Answer: _____


$$9 \times 8$$

Answer: _____


$$45 \div 9$$

Answer: _____


$$7 \times 9$$

Answer: _____


$$72 \div 9$$

Answer: _____


$$9 \times 1$$

Answer: _____


$$36 \div 9$$

Answer: _____


$$9 \times 4$$

Answer: _____


$$90 \div 9$$

Answer: _____


$$12 \times 9$$

Answer: _____


$$54 \div 9$$

Answer: _____

PREVIEW

FACT FAMILY FLIP

Players: 2–4

Goal: Collect complete fact families.

1. Cut out the matching cards.
2. Shuffle and place them face down.
3. Take turns flipping two cards.
4. Keep the cards if they belong to the same fact family.
5. A complete set has four related equations. The player with the most complete sets wins.

EXAMPLE: 4, 9, 36

MULTIPLY

$$9 \times 4 = 36$$

TURNAROUND

$$4 \times 9 = 36$$

9

4

36

DIVIDE BY 9

$$36 \div 9 = 4$$

**DIVIDE BY
THE OTHER FACTOR**

$$36 \div 4 = 9$$

FACT FAMILY FLIP MATCHING CARDS

Cut out, shuffle and match each set of four related equations.


$$9 \times 4 = 36$$



$$4 \times 9 = 36$$



$$36 \div 9 =$$



$$36 \div 4 = 9$$



$$9 \times 7 = 63$$



$$7 \times 9 = 63$$



$$63 \div 9 = 7$$



$$63 \div 7 = 9$$



$$9 \times 8 = 72$$



$$8 \times 9 = 72$$



$$72 \div 9 = 8$$



$$72 \div 8 = 9$$


NIFTY NINES ASSESSMENT - PAGE 1

Name: _____

Date: _____

A. Complete the facts.

1. $2 \times 9 = \underline{\quad}$

2. $4 \times 9 = \underline{\quad}$

3. $6 \times 9 = \underline{\quad}$

4. $8 \times 9 = \underline{\quad}$

5. $11 \times 9 = \underline{\quad}$

B. Solve.

6. $9 \times 12 = \underline{\quad}$

7. $63 \div 9 = \underline{\quad}$

8. $45 \div \underline{\quad} = 9$

9. $9 \times \underline{\quad} = 72$

C. Find a fact family.

1. Use 9, 6 and 54 to write two multiplication facts and two division facts.

	$\times$		$=$	
----------------------	----------	----------------------	-----	----------------------

	$\times$		$=$	
----------------------	----------	----------------------	-----	----------------------

	$\div$		$=$	
----------------------	--------	----------------------	-----	----------------------

	$\div$		$=$	
----------------------	--------	----------------------	-----	----------------------

NIFTY NINES ASSESSMENT - PAGE 1

Name: ANSWERS

Date: _____

A. Complete the facts.

1. $2 \times 9 = \underline{18}$

2. $4 \times 9 = \underline{36}$

3. $6 \times 9 = \underline{54}$

4. $8 \times 9 = \underline{72}$

5. $11 \times 9 = \underline{99}$

B. Solve.

6. $9 \times 12 = \underline{108}$

7. $63 \div 9 = \underline{7}$

8. $45 \div 9 = \underline{5}$

9. $9 \times 7 = \underline{63}$

C. Find a fact family.

1. Use 9, 6 and 54 to write two multiplication facts and two division facts.

$$\boxed{9} \times \boxed{6} = \boxed{54}$$

$$\boxed{6} \times \boxed{9} = \boxed{54}$$

$$\boxed{54} \div \boxed{9} = \boxed{6}$$

$$\boxed{54} \div \boxed{6} = \boxed{9}$$

NIFTY NINES ASSESSMENT - PAGE 2

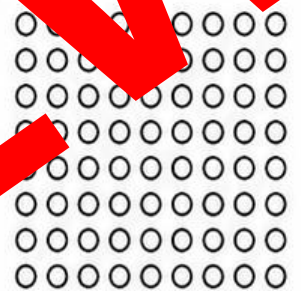
Name: _____

Date: _____

1. A bakery packs 8 trays with 9 muffins on each tray. How many muffins are packed altogether? Show your equation.



2. Sixty-three counters are placed into groups of 9. How many groups made? Show your equation.



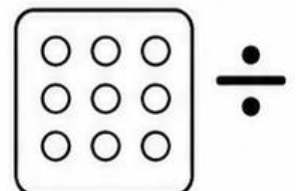
3. Ava says, " $9 \times 8 = 81$ ". Is Ava correct? Explain and correct the fact.



4. Use $10 \times$, then subtract one group to solve 9×7 . Show your working.



5. Write a division equation with an answer of 9. Use a multiple of 9.



NIFTY NINES ASSESSMENT - PAGE 2

Name: ANSWERS

Date: _____

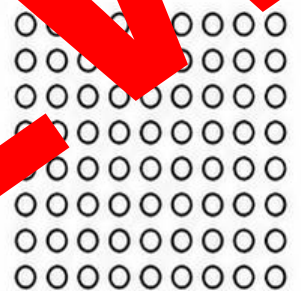
1. A bakery packs 8 trays with 9 muffins on each tray. How many muffins are packed altogether? Show your equation.

72 muffins; $8 \times 9 = 72$.



2. Sixty-three counters are placed into groups of 9. How many groups made? Show your equation.

7 groups; $63 \div 9 = 7$.



3. Ava says, " $9 \times 8 = 81$ ". Is Ava correct? Explain and correct the fact.

No. $9 \times 8 = 72$.



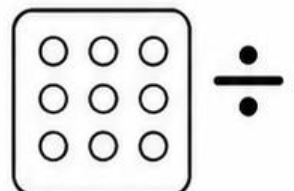
Use $10 \times$, then subtract one group to solve 9×7 . Show your working.

$10 \times 7 - 7 = 70 - 7 = 63$.



5. Write a division equation with an answer of 9. Use a multiple of 9.

Example: $81 \div 9 = 9$.



NINE NINES RUBRIC



Name: _____

Date: _____

CRITERIA	BEGINNING	DEVELOPING	ACHIEVING	CONFIDENT	EXCEEDING
Recalls nine facts	Recalls a few facts with support.	Recalls some facts.	Recalls most facts accurately.	Recalls facts efficiently.	Recalls and applies facts automatically.
Uses strategies	Needs prompts to choose a strategy.	Uses one strategy with guidance.	Selects and uses a suitable strategy.	Explains and compares strategies.	Justifies the most efficient strategy.
Connects multiplication and division	Recognises some related facts.	Writes some related facts.	Builds on related facts.	Uses inverse facts flexibly.	Generalises fact relationships.
Solves and explains problems	Needs support to solve and explain.	Solves simple problems with partial explanation.	Solves problems and shows clear workings.	Solves unfamiliar problems with clear reasoning.	Creates and explains new applications.

Nifty Nines

PREVIEW



Meet the Nines

Nine-times facts follow a powerful pattern.
Each product is 9 more than the one before.



Spot the Pattern

9, 18, 27, 36, 45, 54, 63, 72, 81, 90

The tens digit rises while the ones digit falls.



Use Known Facts

Use 10 groups, then subtract one group.

$$9 \times 6 = 10 \times 6 - 6 = 60 - 6 = 54$$



Try Known Facts

$$9 \times 4 = 10 \times 4 - 4 = 36$$

$$9 \times 8 = 10 \times 8 - 8 = 72$$



Finger Method

Hold up ten fingers. Fold down the finger named by the second factor.

Fingers on the left show tens; fingers on the right show ones.



Finger Method Example

For 9×7 , fold the seventh finger.

6 fingers are left and 3 are right, so $9 \times 7 = 63$.



Turn It Around!

Multiplication can be turned around.

$$9 \times 3 = 3 \times 9 = 27$$



Build Fact Families

Use three numbers to build four related facts.

$$9 \times 5 = 45 \quad 5 \times 9 = 45$$

$$45 \div 9 = 5 \quad 45 \div 5 = 9$$



Arrays Show Why

An array shows equal rows and columns.

3 rows of 9 make 27, so $3 \times 9 = 27$.



Division Undoes Multiplication

Division undoes multiplication.

If $9 \times 8 = 72$, then $72 \div 9 = 8$.



Divide by Nine

Think: How many groups of 9?

$81 \div 9 = 9$ because $9 \times 9 = 81$.



Missing Numbers

Use the fact family to find the missing number.

$9 \times \square = 108$, so $108 \div 9 = 12$.



Estimate and Check

Estimate first then check with multiplication.

$126 \div 9$ is close to 35 $\div 9$ so the answer should be near 15.



Mixed Practice

PREVIEW

$$\times 7 = ? \quad 63 \div 9 = ?$$

$$\times 1 = 50 \quad 108 \div 9 = ?$$



Strategy Toolkit

Choose a strategy:

pattern • known facts • finger method

irregular sound • fact family • array



All the Nifty Nines

Multiplication and division facts with 9 are connected.

Look for patterns, use known facts and check with the inverse.

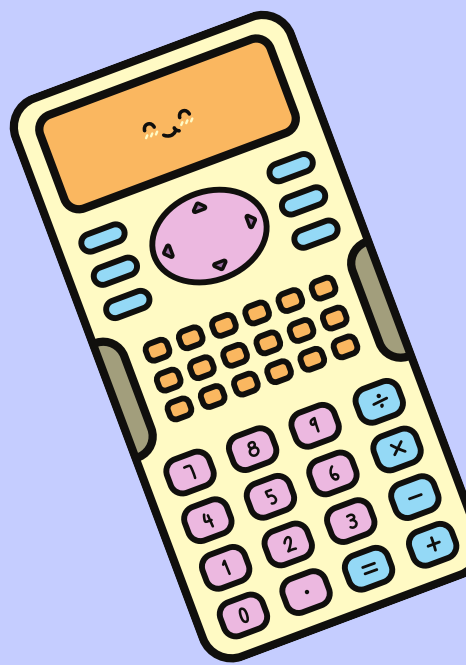
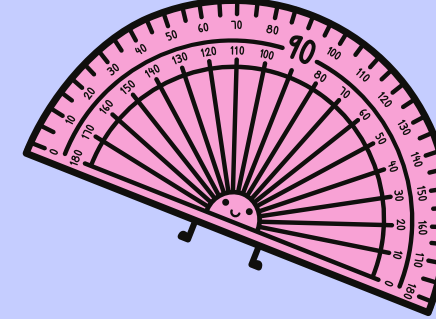
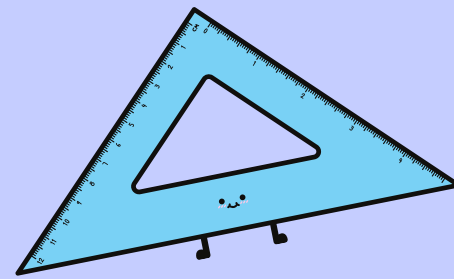
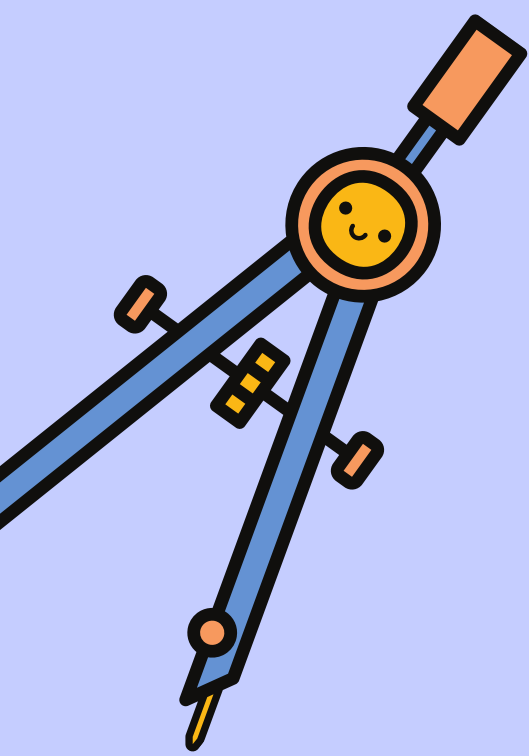


Review

Explain one strategy for 9×6 .

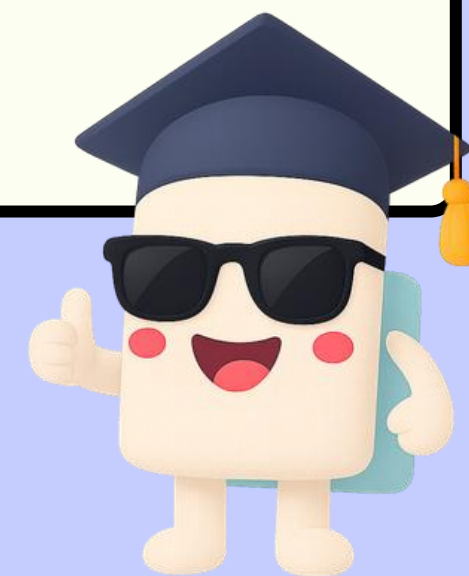
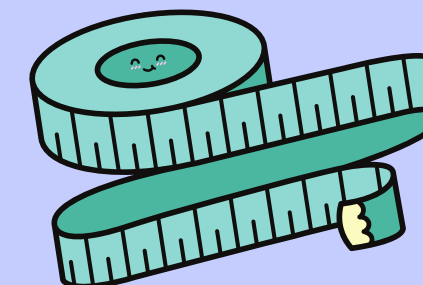
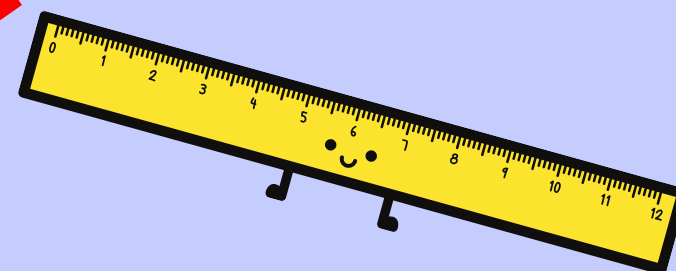
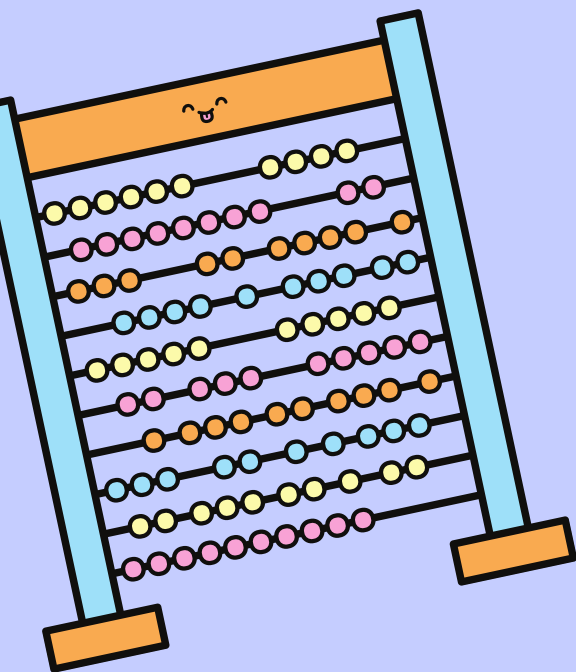
Then solve $117 \div 9$ and justify your answer.





Well Done!

PREVIEW



Nifty Nines

Prequiz



Question 1

PREVIEW

What is 9×7 ?



Answer 1

PREVIEW

$$9 \times 7 = 63.$$



Question 2

Which value is equal to 9×6 ?

A. 45 B. 54 C. 63 D. 72



Answer 2

PREVIEW

B. 54

$$9 \times 6 = 54.$$



Question 3

True or false?

$$9 \times 8 = 72$$



Answer 3

PREVIEW

True
 $9 \times 8 = 72.$



Question 4

PREVIEW

What is $81 \div 9$?



Answer 4

PREVIEW

$$9 \div 9 = 9.$$



Question 5

Which fact belongs to the fact family 9, 5 and 45?

A. $45 \div 9 = 5$ B. $45 \div 5 = 8$

C. $9 \times 4 = 45$ D. $5 \times 8 = 45$



Answer 5

$$A: 45 \div 9 = 5$$

The same family also includes $9 \times 5 = 45$.



Question 6

True or false?

$$63 \div 7 = 9$$



Answer 6

PREVIEW

True

Because $7 \times 9 = 63$.



Question 7

Find the missing number.

$$9 \times \square = 108$$



Answer 7

PREVIEW

12

$$108 \div 9 = 12.$$



Question 8

Which known-facts strategy best completes 9×4 ?

A. $10 \times 4 - 4$ B. $10 \times 4 + 4$

C. $8 \times 4 - 4$ D. $9 \times 5 + 9$



Answer 8

PREVIEW

$$A = 10 \times 4 - 4$$

$$40 - 4 = 36.$$



Question 9

True or false?

$$9 \div 3 = 3 \times 9$$



Answer 9

PREVIEW

True

Both products equal 27.



Question 10

There are 72 counters in equal groups of 9.

How many groups are there?



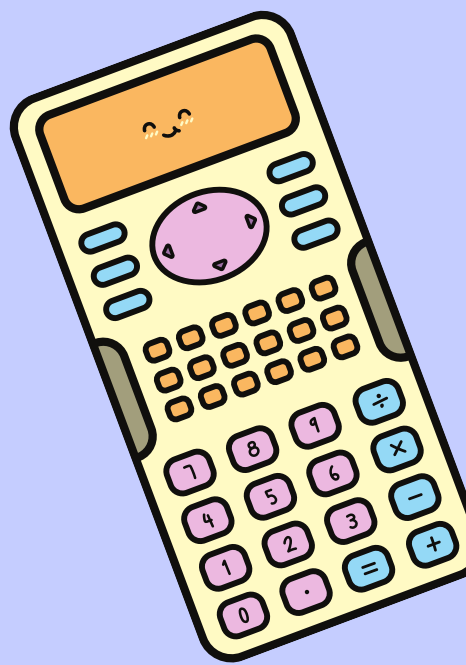
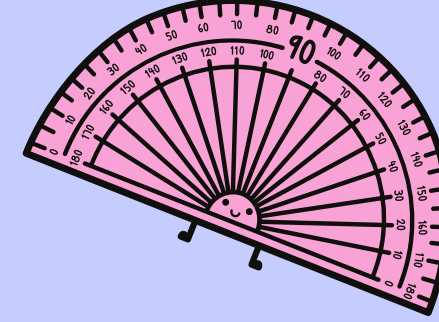
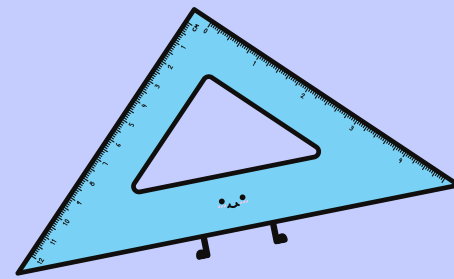
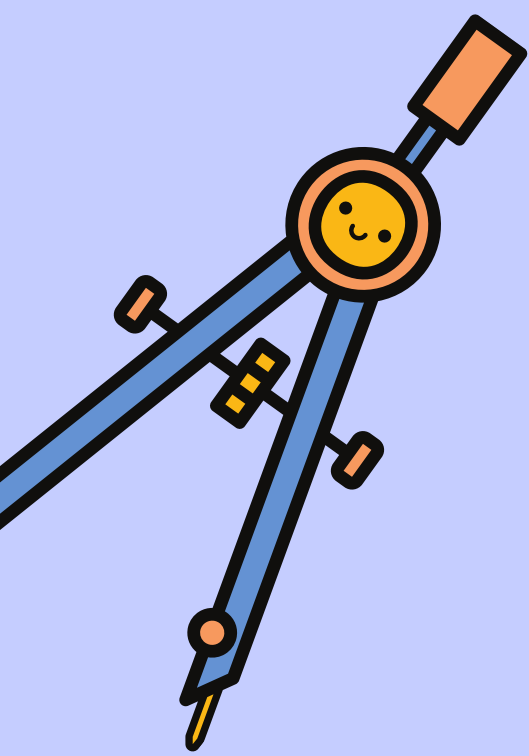
Answer 10

PREVIEW

9 groups

$$72 \div 9 = 8.$$





Well Done!

PREVIEW

