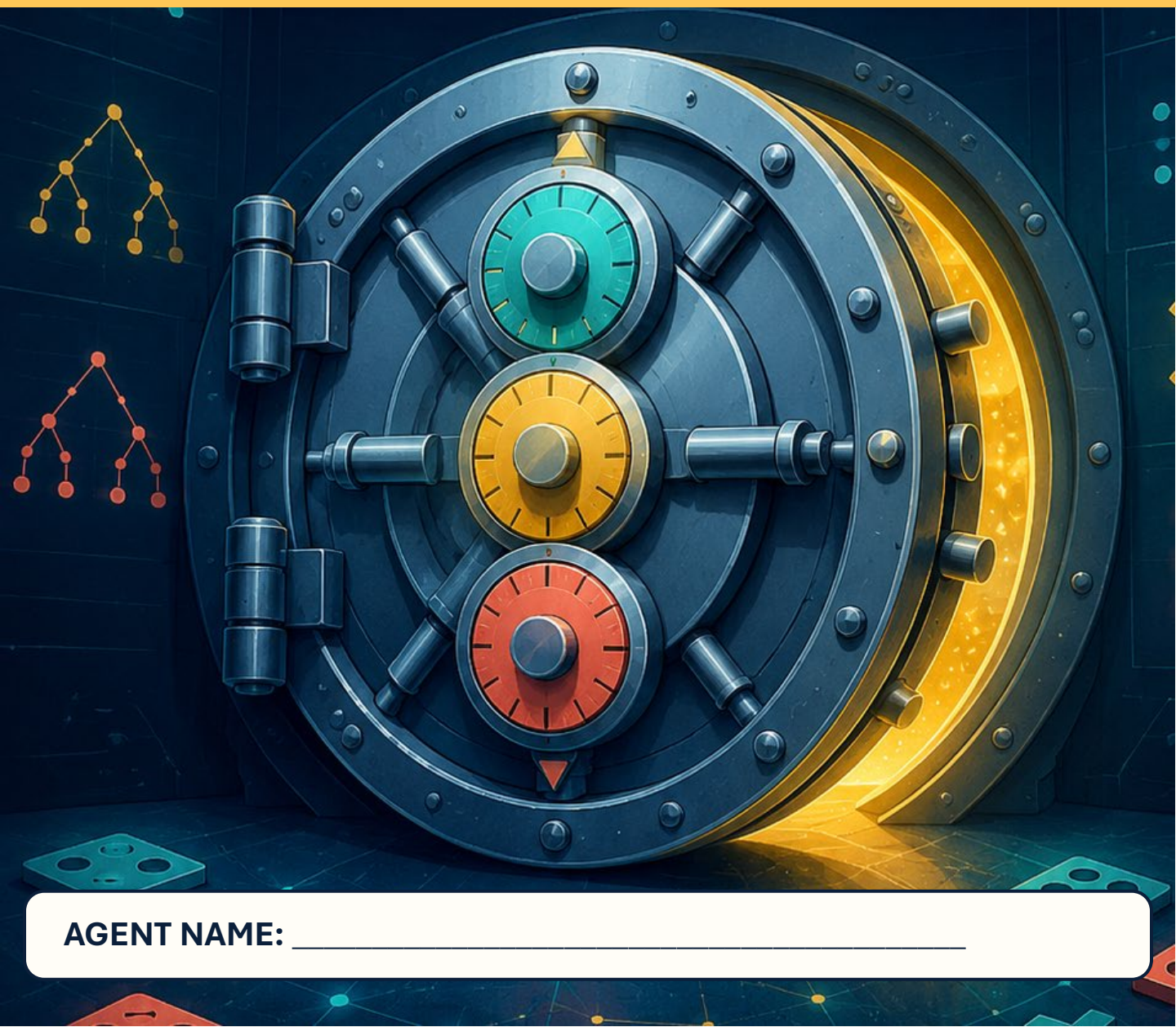


OPERATION: FACTOR LOCK

A NUMBER LOCK SAFE / CODE-BREAKING MISSION

Build factor products. Test divisibility. Track multiples. Crack the code.



AGENT NAME: _____

Teacher Mission Brief

LEARNING FOCUS

Students express target numbers as products of factor pairs, test whether one-digit numbers divide exactly, and generate multiples to a limit.

1 Prepare

- Print slides 3–7 in colour, single-sided, at 100% / Actual Size.
- Give each pair the Safe Room page and the two Evidence Logs.
- Cut the four code strips on slide 7 and keep them face-down in an envelope.

2 Run the mission

- Model the training safe on slide 3. Emphasise that each factor pair is written once.
- Students solve each target, record evidence, build the 3-digit code and choose a strip.
- A code opens a safe only when all three pieces of evidence are complete.

3 Check and extend

- **Assess:** complete factor pairs; exact quotients; an ordered multiple list that includes the target.
- **Support:** provide $1 \times$ target and a multiplication chart; solve one safe at a time.
- **Extend:** students design a new target from 20–50 and make a valid code strip for a partner.

Success check: Can the student explain why each chosen divisor leaves no remainder?

Training Safe: Learn the Code

Every safe uses the same three dials. Your evidence must match your code.



TRAINING TARGET



FACTOR PAIRS

$1 \times 18, 2 \times 9, 3 \times 6$
There are 3 different pairs.



DIVISOR SCAN

Exact one-digit divisors: 1, 2, 3, 6, 9
The greatest is 9.



MULTIPLE TRAIL

18, 36, 54, 72, 90, 108, 126, 144
There are 8 multiples up to 150.



TRAINING CODE



The Safe Room

Solve on the Evidence Logs first. Then choose the matching code strip and place it in the bay.

SAFE A

TARGET



Crack the target.
Prove every digit.

CODE BAY

Place the
matching strip
here

SAFE B

TARGET



Crack the target.
Prove every digit.

CODE BAY

Place the
matching strip
here

SAFE C

TARGET



Crack the target.
Prove every digit.

CODE BAY

Place the
matching strip
here

SAFE D

TARGET



Crack the target.
Prove every digit.

CODE BAY

Place the
matching strip
here

Agent Evidence Log

Show the mathematics that proves every code digit.

24

SAFE A EVIDENCE

Agent: _____

1 FACTOR PRODUCTS

Write every different factor pair once.

Dial 1 = number of pairs: _____

2 DIVISOR SCAN

Circle every exact divisor from 1–9:

1 2 3 4 5 6 7 8 9

Dial 2 = greatest exact divisor: _____

3 MULTIPLE TRAIL

List the multiples of 24 up to 150.

Dial 3 = number of multiples: _____

FINAL CODE

30

SAFE B EVIDENCE

Agent: _____

1 FACTOR PRODUCTS

Write every different factor pair once.

Dial 1 = number of pairs: _____

2 DIVISOR SCAN

Circle every exact divisor from 1–9:

1 2 3 4 5 6 7 8 9

Dial 2 = greatest exact divisor: _____

3 MULTIPLE TRAIL

List the multiples of 24 up to 150.

Dial 3 = number of multiples: _____

FINAL CODE

Agent Evidence Log

Show the mathematics that proves every code digit.

36

SAFE C EVIDENCE

Agent: _____

1 FACTOR PRODUCTS

Write every different factor pair once.

Dial 1 = number of pairs: _____

2 DIVISOR SCAN

Circle every exact divisor from 1–9:

1 2 3 4 5 6 7 8 9

Dial 2 = greatest exact divisor: _____

3 MULTIPLE TRAIL

List the multiples of 24 up to 150.

Dial 3 = number of multiples: _____

FINAL CODE

48

SAFE D EVIDENCE

Agent: _____

1 FACTOR PRODUCTS

Write every different factor pair once.

Dial 1 = number of pairs: _____

2 DIVISOR SCAN

Circle every exact divisor from 1–9:

1 2 3 4 5 6 7 8 9

Dial 2 = greatest exact divisor: _____

3 MULTIPLE TRAIL

List the multiples of 24 up to 150.

Dial 3 = number of multiples: _____

FINAL CODE

Vault Code Strips

Keep these face-down until students have recorded their evidence.
Cut exactly on each dashed outline; every strip fits a safe code bay.

SHUFFLED ACCESS CODES



CUT



CUT



CUT



CUT

BONUS: BUILD-A-LOCK

Choose a target from 20–50. Prove its code on scrap paper,
write the digits on a blank strip and challenge another agent.



MY CODE STRIP



Write one digit in each window,
then cut on the dashed line.

Mission Control (Answer Key)

Dial order: factor-pair count • greatest one-digit divisor • multiple count to 150

24

SAFE A

Factor pairs: 1×24 , 2×12 , 3×8 , 4×6

Divisors: 1, 2, 3, 4, 6, 8

Multiples: 24, 48, 72, 96, 120, 144

CODE

4

8

6

30

SAFE B

Factor pairs: 1×30 , 2×15 , 3×10 , 5×6

Divisors: 1, 2, 3, 5, 6

Multiples: 30, 60, 90, 120, 150

CODE

4

6

5

36

SAFE C

Factor pairs: 1×36 , 2×18 , 3×12 , 4×9 , 6×6

Divisors: 1, 2, 3, 4, 6, 9

Multiples: 36, 72, 108, 144

CODE

5

9

4

48

SAFE D

Factor pairs: 1×48 , 2×24 , 3×16 , 4×12 , 6×8

Divisors: 1, 2, 3, 4, 6, 8

Multiples: 48, 96, 144

CODE

5

8

3

Look for: the square pair 6×6 counted once • target included as the first multiple • no multiple greater than 150