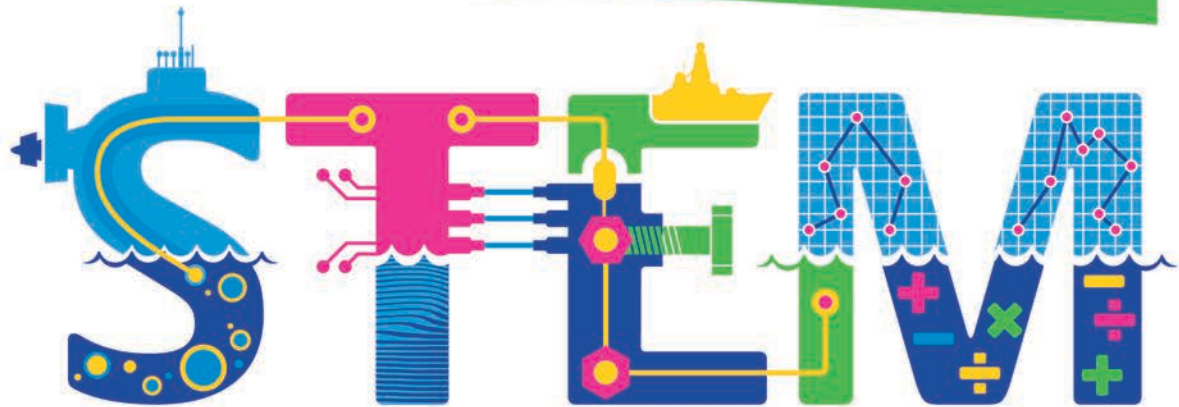


babcock™



SCIENCE | TECHNOLOGY | ENGINEERING | MATHS

Activity Book

Edition 2



$$6 + 4 =$$

S P H A W
U T R A A
P P Y O E
F I E P



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Introduction

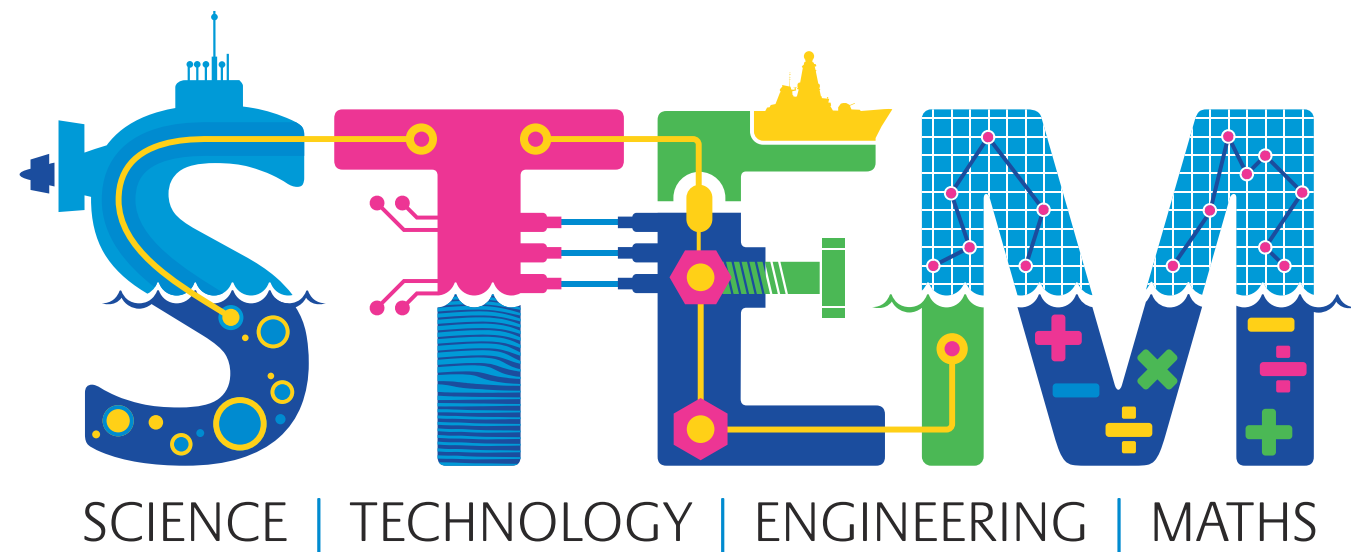
This booklet has been produced by the STEM Team at Devonport to provide fun, marine and nuclear inspired activities, which take readers on an exciting and educational journey through Devonport Royal Dockyard, inspiring them through STEM based learning.

If you would like to submit any of your drawings or give us feedback, please email them to: Babcock.STEM.Events@babcockinternational.com

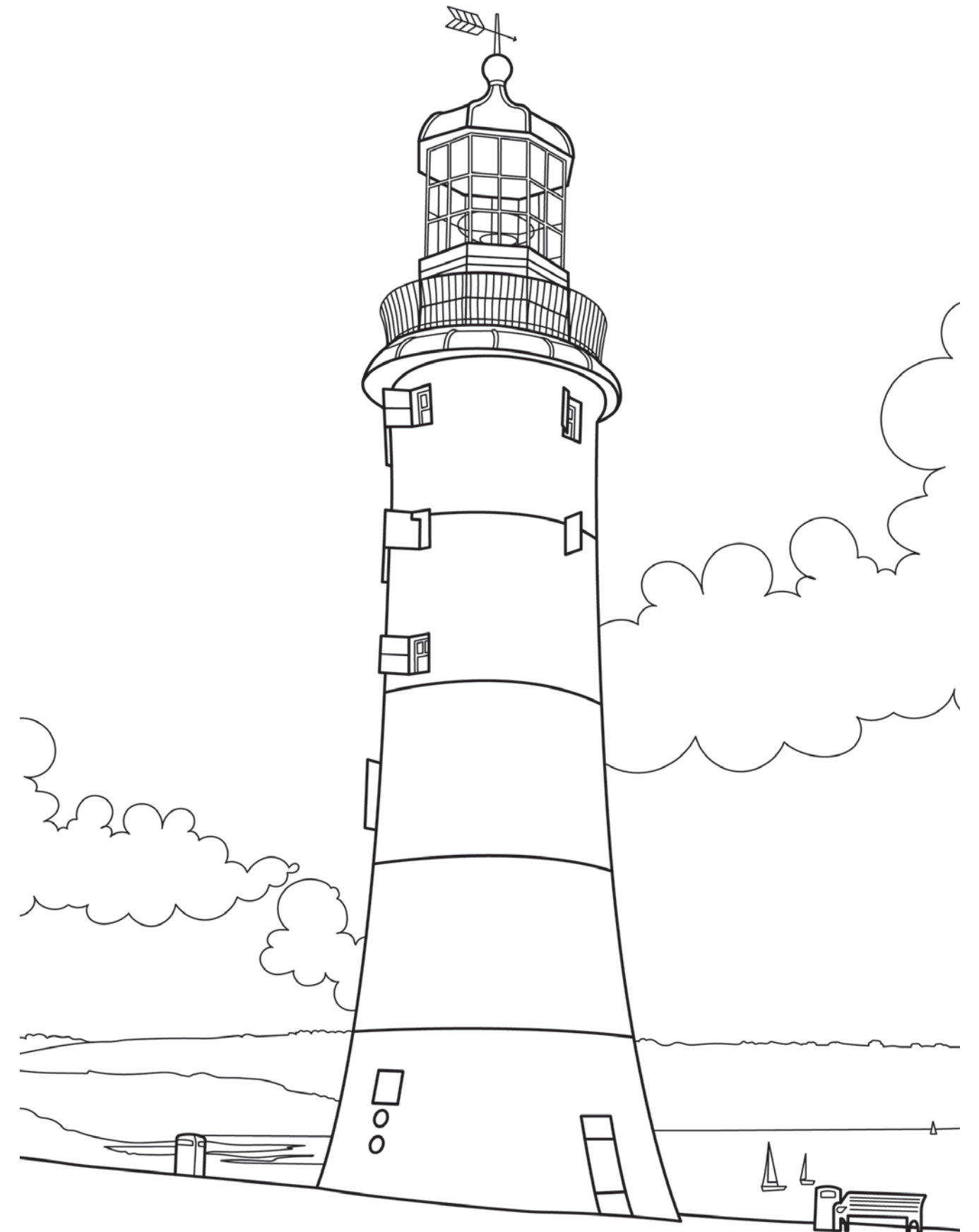
We hope you enjoy our second edition of our Activity Book.

For further information about Babcock's STEM Team further activities for you to complete at home, please follow the below link.

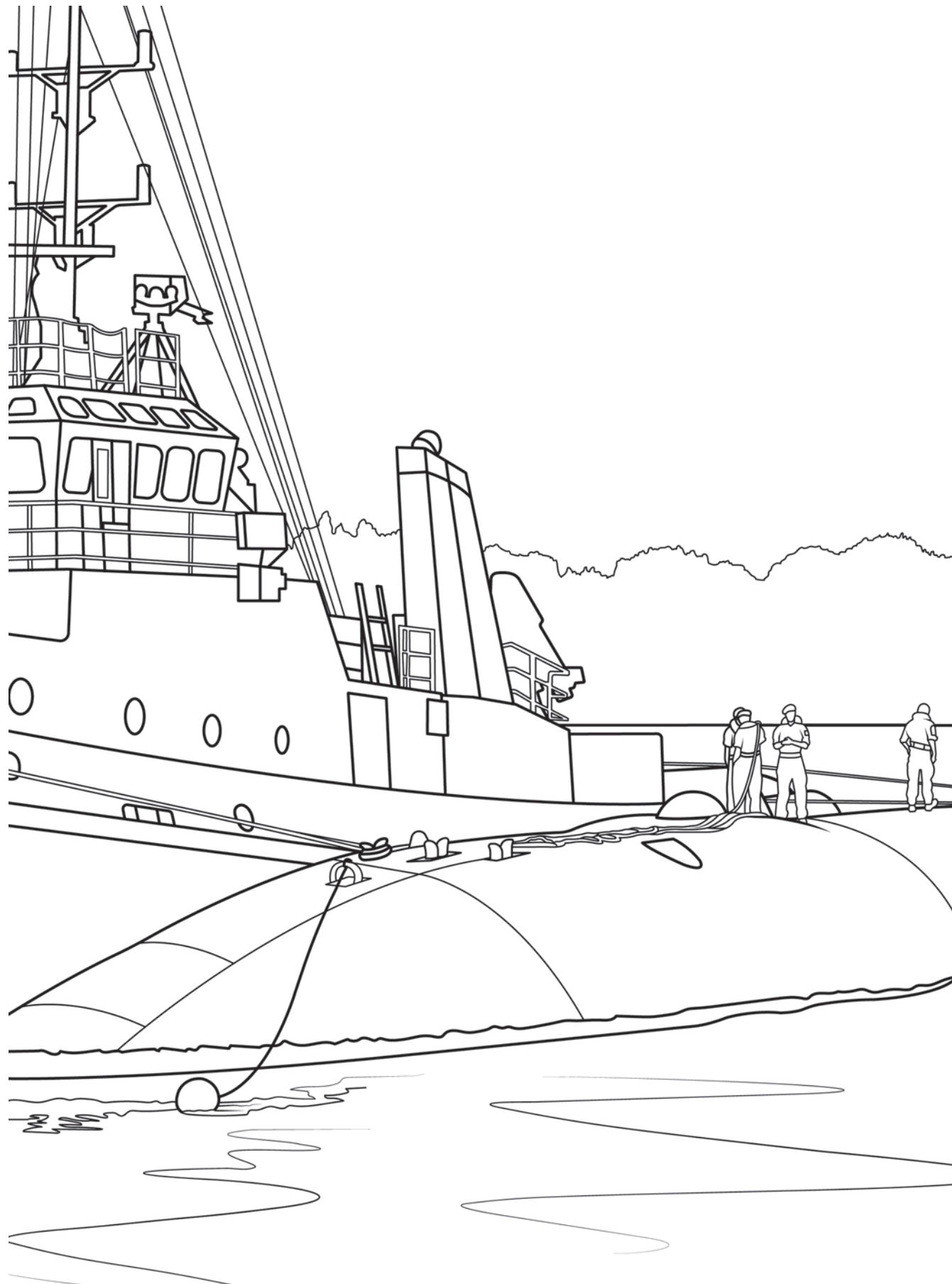
www.babcockinternational.com/who-we-are/babcock-and-stem/



Colour in the lighthouse



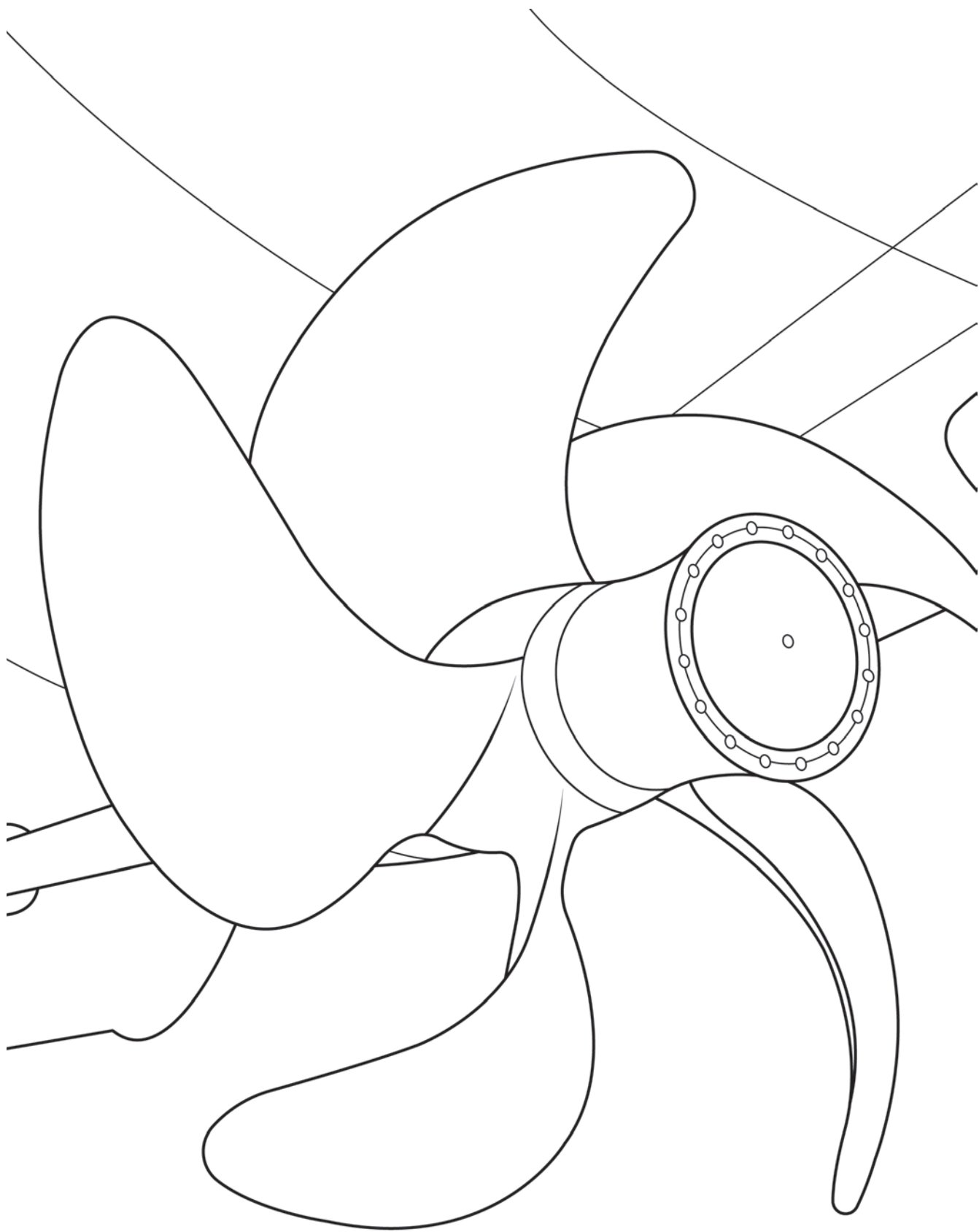
Colour in the submarine



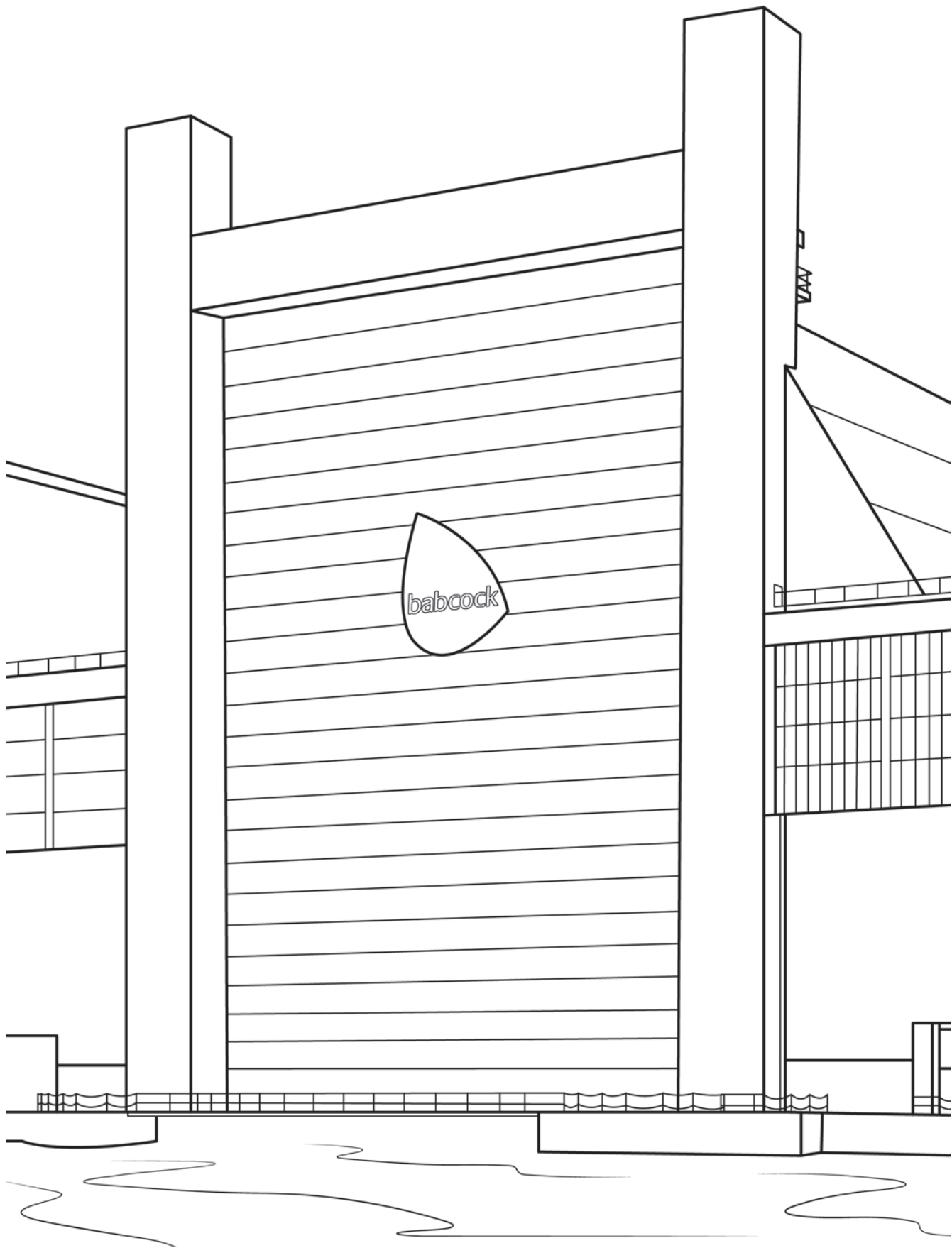
Colour in the engineer



Colour in the propeller



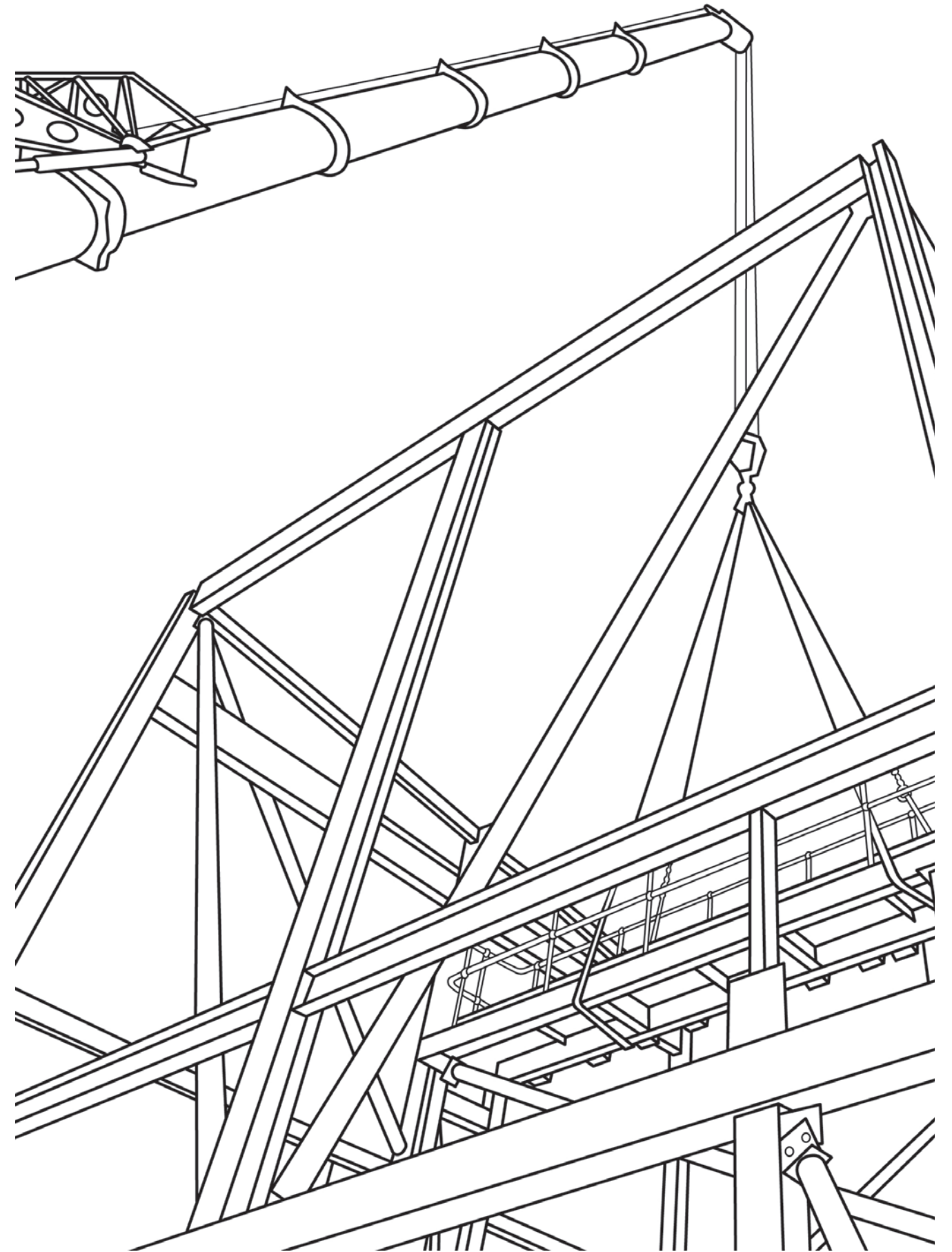
Colour in the building



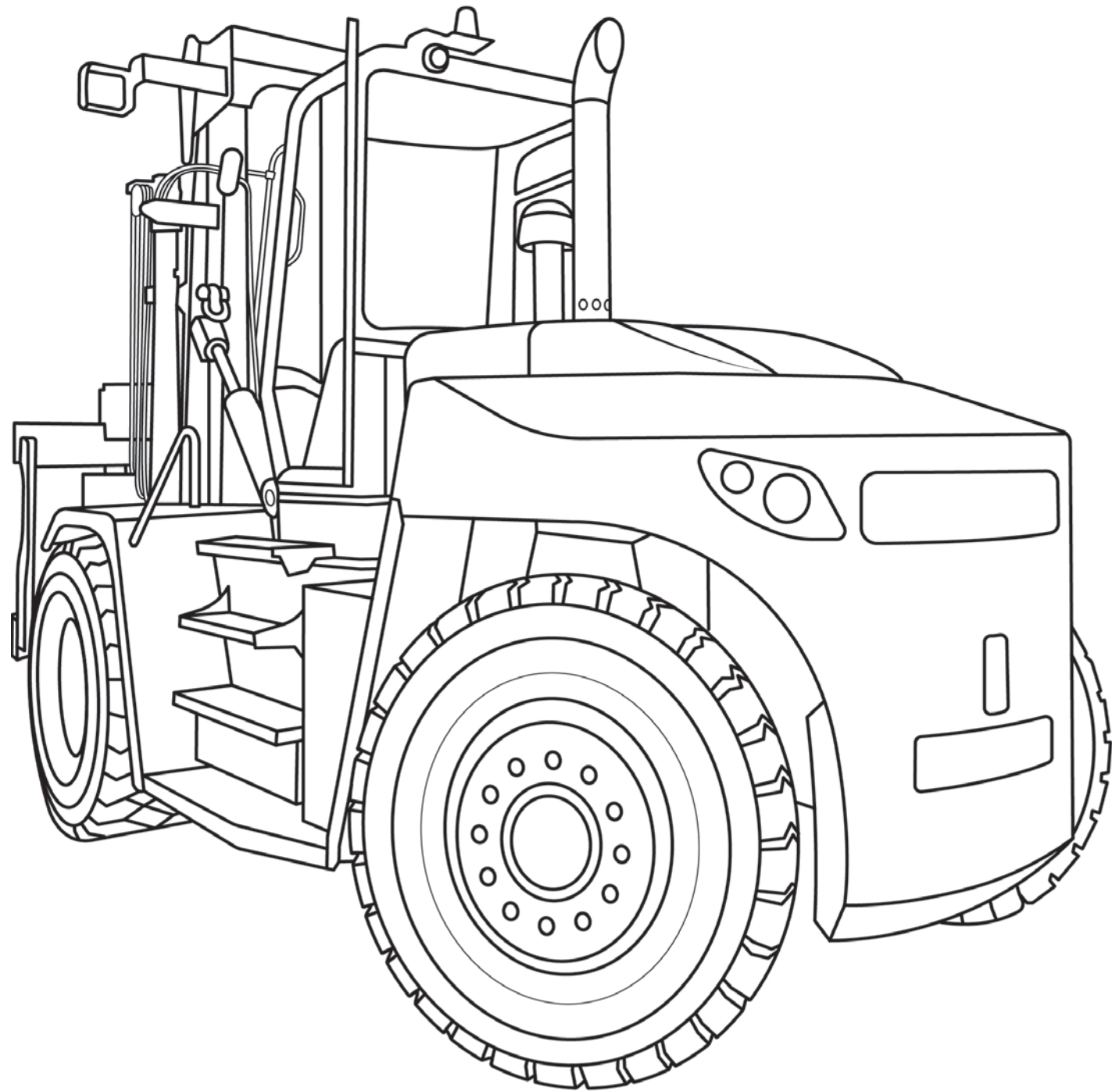
Colour in the apprentices



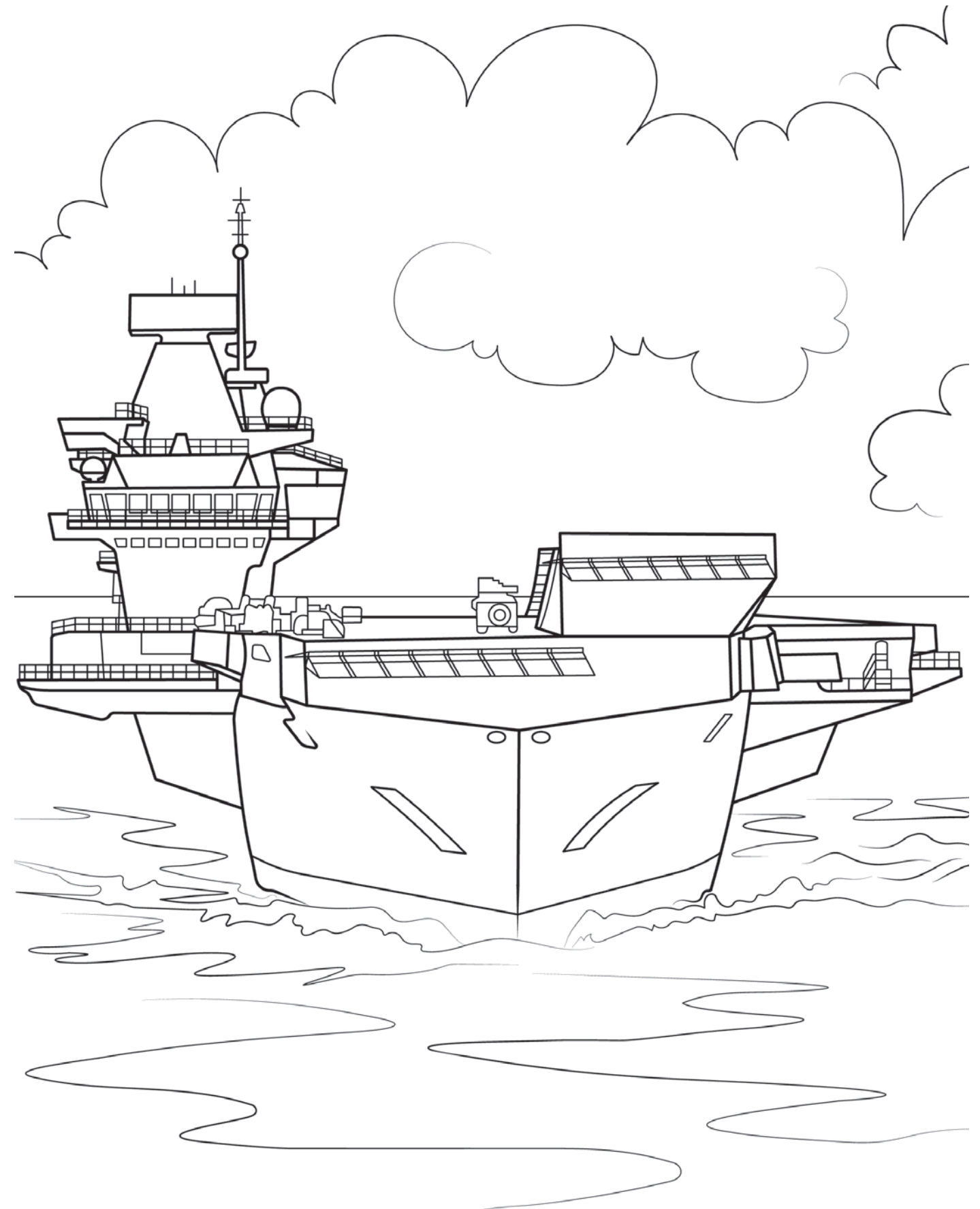
Colour in the crane



Colour in the forklift truck

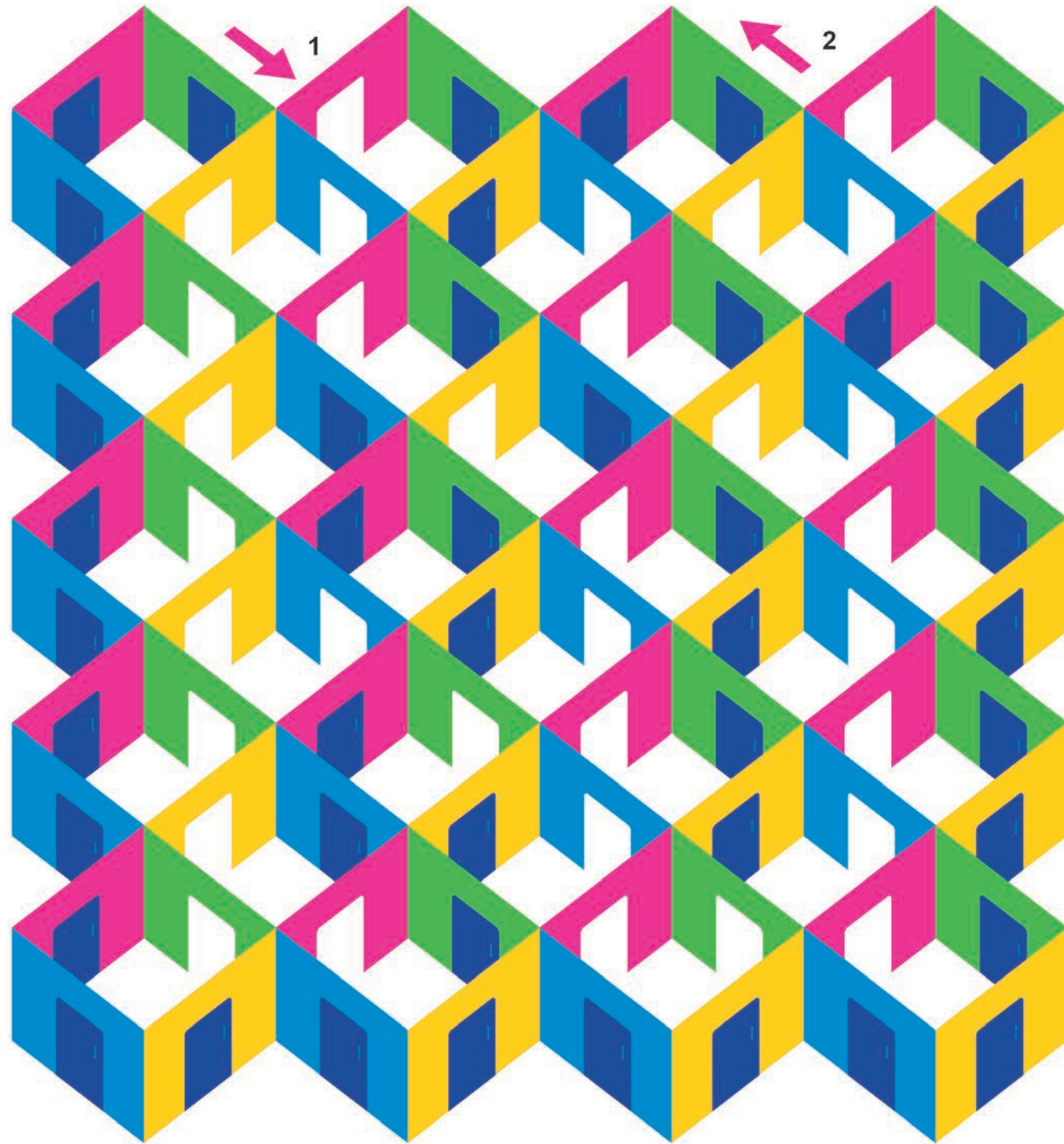


Colour in the aircraft carrier



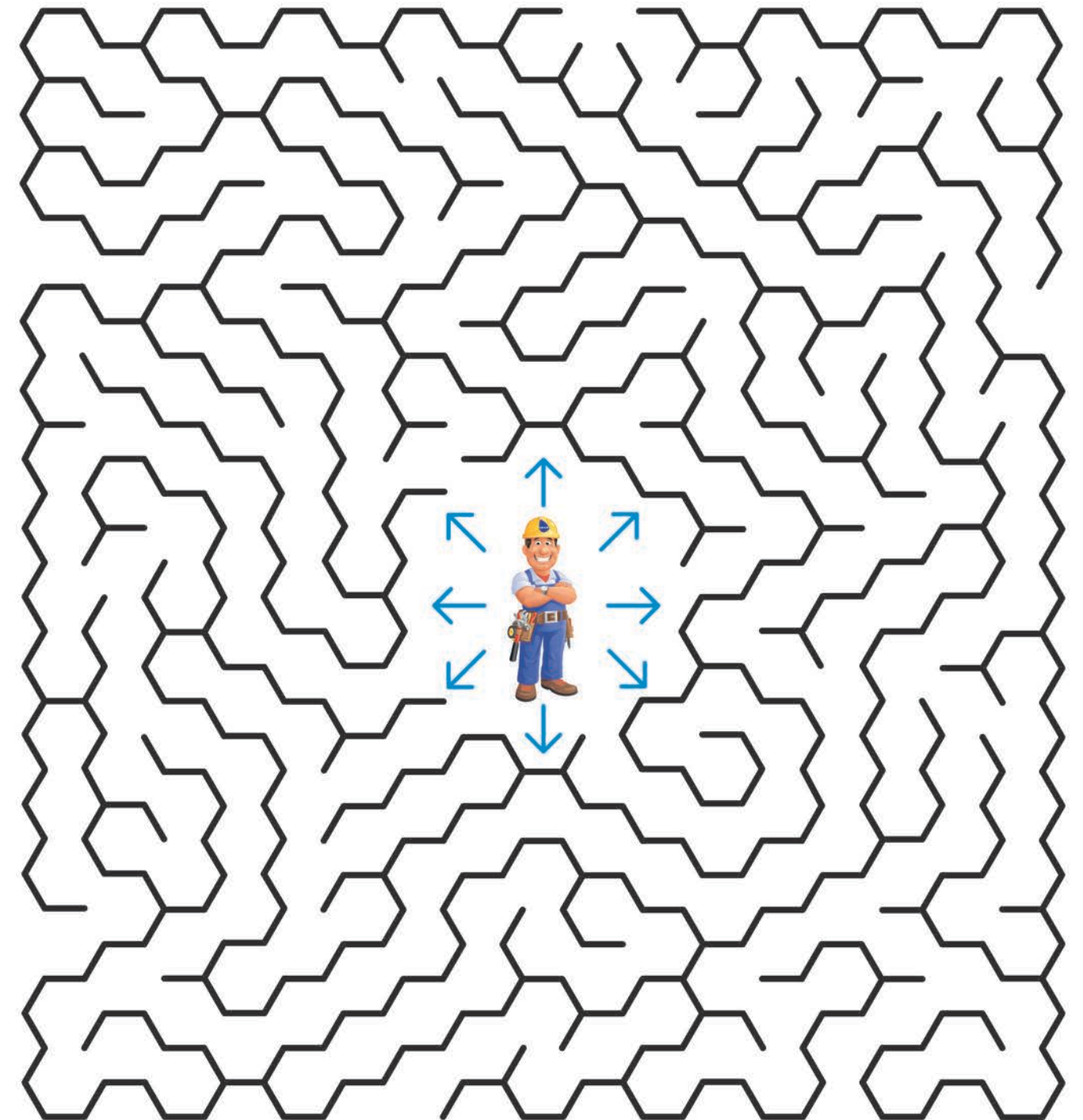
Maze game: Doors

Can you find your way through the open doors? Enter door 1 and get out of the maze through door 2.



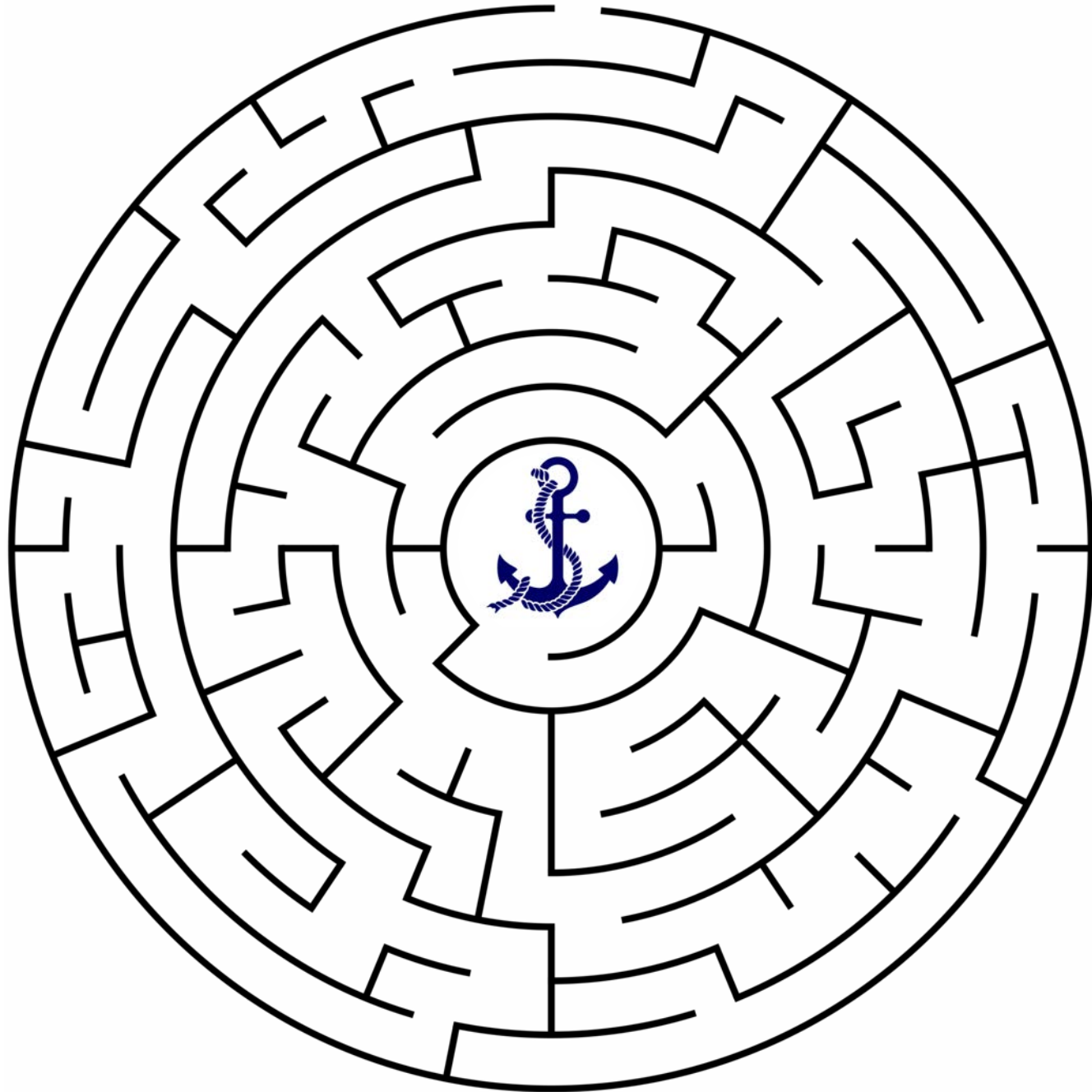
Maze game: Ship escape

The engineer is lost deep inside a ship and all the watertight doors to get out look the same. Can you help him find his way out?



Maze game: Ship & anchor

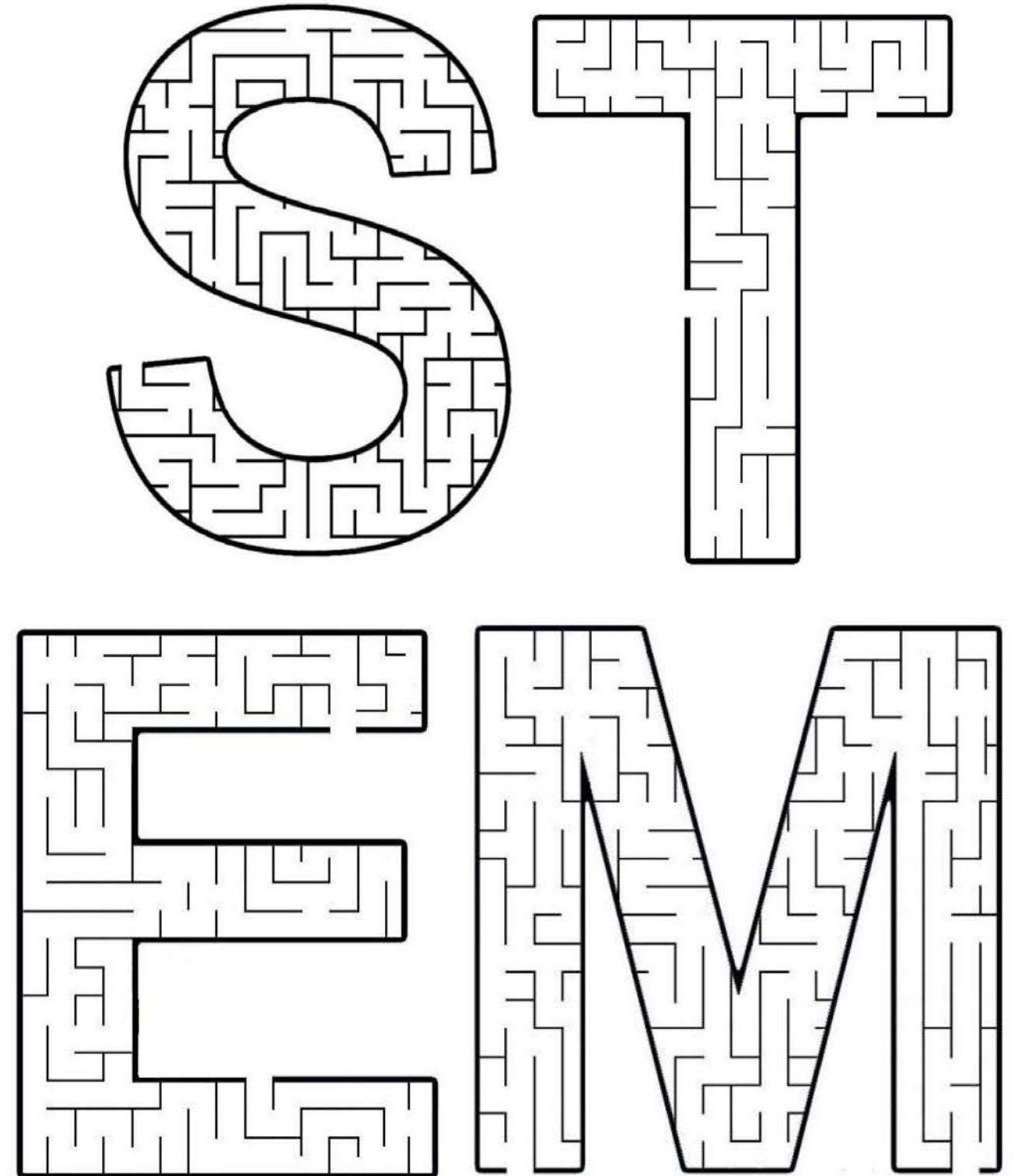
There has been a big storm in Plymouth Sound and a ship has lost its anchor. Can you help the ship's crew find it?



Copyright © 2020 JGB Service, <http://www.mazegenerator.net/>

Maze game: STEM

Can you find your way through each of the mazes contained in the STEM letters?



Maze game: Prime number



Do you know what a prime number is? If not here is a basic explanation:
A prime number is a number greater than 1 that cannot be divided evenly by any number than itself or 1.

The two new Babcock engineers have been seperated, can you follow the path of prime numbers to re-unite them?

We have highlighted the first few moves to get you started.

85	65	30	65	60	41	22	18	46	8	21	38
12	58	80	82	30	83	82	88	45	68	36	35
78	79	2	83	73	37	18	60	85	35	49	27
9	71	14	60	16	70	54	72	52	60	70	76
30	59	7	43	72	82	63	85	22	10	75	69
30	56	69	41	12	10	80	10	39	87	86	12
12	9	9	83	59	14	5	37	73	9	51	66
52	27	50	30	83	61	31	69	3	47	59	83
74	60	60	72	55	44	45	30	42	30	52	53
51	69	10	12	28	18	12	9	85	12	82	17
82	70	84	38	60	18	42	18	18	32	77	73
66	14	22	63	80	39	65	60	60	55	60	53
45	60	38	69	74	30	30	60	87	14	3	47
12	60	39	74	12	52	50	38	68	89	29	69
42	55	39	68	52	9	33	60	71	29	12	14
26	54	60	84	12	38	9	74	37	77	10	21
30	30	60	84	12	38	9	74	2	33	44	58



Wordsearch: Electronic components

Z	T	R	A	N	S	I	S	T	O	R	S	R	G
L	L	C	I	T	S	A	L	P	U	G	N	C	T
O	E	L	R	E	S	U	F	L	I	S	O	O	T
V	G	O	N	L	A	M	P	O	C	P	I	P	S
C	T	I	U	C	R	I	C	U	O	L	T	P	O
B	A	U	L	I	G	H	T	T	M	U	A	E	L
R	A	B	H	O	O	T	E	P	P	G	U	R	D
O	L	T	L	C	L	T	R	U	O	P	L	M	E
T	M	L	T	E	T	E	U	T	N	S	A	S	R
S	P	O	I	E	Z	I	C	R	E	E	V	U	I
I	O	E	T	Z	R	E	W	I	N	R	E	T	N
S	E	T	U	O	W	Y	S	S	T	I	E	A	G
E	B	B	D	R	R	E	P	P	S	W	L	F	N
R	Z	M	L	I	Y	T	E	F	A	S	T	A	S

Light	Wires	Buzzer	Plastic
Output	Fuse	Resistor	Circuit
Components	Motor	Switch	Evaluation
Lamp	Cable	Soldering	Copper
Battery	Safety	Transistor	Plug

Wordsearch: Climate change

C L I M A T E C H A N G E N S E
Y G L O B A L W A R M I N G Y R
T E T N E M N O R I V N E G S E
I L E U F L I S S O F I R B E C
L T E M P E R A T U R E I S N Y
I T N I R P T O O F N O B R A C
B R E H T A E W R E D I O U H L
A D E G E A I R E I I I T N T E
N R S R E A A L V R O O E B E C
I O E E B A B E R G L O T P M U
A U R E F A R R L E U F O I B D
T G O N W S G N I D O O L F B I
S H E E I N O I T U L L O P T P
U T N T E X T I N C T I O N L M
S E Y C A R B O N D I O X I D E
R S A G E S U O H N E E R G L B

Climate change	Carbon footprint	Fossil fuel	Extinction
Temperature	Pollution	Sustainability	Renewable energy
Flooding	Global warming	Weather	Methane
Carbon dioxide	Green	Biofuel	Biodiversity
Drought	Greenhouse gas	Environment	Recycle

Wordsearch: STEM

W K E I X H K Y T L N E I K V
V U V X E H W F R S O I O E P
A L T Z P H B O A I W G N I U
U E B R G E V V R Z P P K X S
E Z T X I K R U B G L D C C Z
G Z X A S A S I R P L J I N O
V N E M E L L P M C F E V R B
T H I N K R D C S E N X D A U
S H T A M U C T A C N T I E I
E R O L P X E A E P Y T S L L
F Z W X D M A T P G J S C U D
T E C H N O L O G Y S L O B E
V Z S N D L K K V E O U V L M
P U J C T P E C U T A E E V O
T N E P N W M G Z U I Q R B C

Science	Learn	Trial
Maths	Guess	Build
Technology	Create	Explore
Art	Think	Grow
STEM	Experiment	Discover

Wordsearch: STEM jobs

S T A M A Z B E K G R E N G I N E E R N T
K G Y F U P F T S I G O L O E A H C R A S
T S I N Q B P H Y S I O L O G I S T R X I
L V E I O D D Q J W P W V X L T V L E E G
Z M A T H E M A T I C I A N C A Q E H V O
G A S T R O N O M E R Z F P Z B V T P C L
Q T S I C I S Y H P Y C E D L P J I A H O
X A B J B E A T P S B O T A N I S T R E P
V U O Z Z K A S A O C M I H X Y W E G M O
P H C D N C C I L X Q K Y P C U T M O I R
T R H X T S I G O L O M O T N E W W N S H
T J A H O Z E O C Y K N M S F Z R X A T T
R S D L K N L L T S I G O L O O Z Y E E N
S E I S M O L O G I S T N M R M P Q C C A
W G T G U H V R Z Y X C P P I E W S O O C
A F L I O T V O T X O S V N E S D E V L C
I C N V Y L G E N E T I C I S T T V H O F
T S I G O L O T N O E L A P V K F Q X G X
K C O M P U T E R S C I E N T I S T K I Z
J T C U M B I M G P S Y C H O L O G I S T
T S I G O L O I B A Q M K L O G P U H T T

Anthropologist	Computer Scientist	Mathematician	Physiologist
Archaeologist	Ecologist	Meteorologist	Seismologist
Astronomer	Engineer	Oceanographer	Taxonomist
Biologist	Entomologist	Paleontologist	Zoologist
Botanist	Geneticist	Physicist	
Chemist	Geologist	Psychologist	

Wordsearch: Road safety

Now that it is getting darker in the mornings and evenings it is even more important to remember road safety.
Can you find the road safety related words in the grid below?

HOME SAFE
EVERY DAY



O O B G T L E B T A E S R A C P V U
Q T C I N I C T O G Y W L O O K A Z
Z P P R O R K A M B E R M P D C N H N L
I F O A X R Y E W W S O B V A R J T
B S V T V Y C T R A F F I C R O W Z
S M I S S E I Y E R O V X O K S T U A O
P F S S U B M V C F D D S X N S L C L I
H T I E J E M L A Z O C I I O I K X
T D B N J D N O E S G T G N R G I A
H J I E D N X D R T X F H G R R N T
I E L R E C Y C L I N G T C Y E G B
N U I A R L P G B V H W N G S U J E Y R
K O T W S T R E E T L I G H T R E N Y Q
A O Y A V H E L M E T T R E M D E E P S



Safety	Dark nights	Seatbelt	Lorry	Green
Look	Walking	Bus	Speed	Pavement
Listen	Taxi	Bike	Awareness	Crossing
Stop	Think	Van	Motorcycle	Traffic
Road	Car	Street light	Red	Visibility
Cross	Helmet	Cycling	Amber	Curb

Wordsearch: The sciences

M M E N T O M O L O G Y I V T T
A E L P H Y S I O L O G Y M Y O
N T E E N G I N E E R I N G B S
T E C N E I C S R E T U P M O C
H O T I M H A A O P M A F Y T I
R R R C S E I S M O L O G Y A T
O O O I Y C V Z Y E R O A R N A
P L N D T M O G O E L S S T Y M
O O I E R O O N S O H C T S M E
L G C M L L T T C R I I R I O H
O Y S O O O R E A S W T O M N T
G A G E L Y X S Y N B E N E O A
Y Y G O L O E H C R A N O H X M
A D G O H W P D P R X E M C A N
C Y M A J B B I O L O G Y D T X
O C E A N O G R A P H Y R X C U

Anatomy	Chemistry	Genetics	Paleontology
Anthropology	Ecology	Geology	Physics
Archeology	Electronics	Mathematics	Physiology
Astronomy	Engineering	Medicine	Seismology
Biology	Entomology	Computer Science	Taxonomy
Botany	Forestry	Oceanography	Zoology
			Meteorology

Wordsearch: Introduction to robotics

D G A T R A N S F O R M E R S P T R X G Y P O T
Z U R S F C Z C N T E C H N O L O G Y G C M A T
C B V E D H T P B N F X S E U H F M M O P L E G
F X S N D S Y F Y H R R S R P W H F Z O P L E G
C E I S R Y Y E H U M A N O I D O U K Z G U U P
C H U O R I S T N B I D M P E W R T O O F R R R
D R Z R H L I C R G K T O C Y D O U W I L L D E
I A I S P U A P U H I U R I R U B R V L B V U C
S A G N C P P L T V F N O T L C O E B V N Q N O
N V Y R P E M E P A J A E R J I T X Z T M M Y G
F E I O Y X A M H O D R W E K B S S M P Q D D N
E C O P B J T E X U O T H E R L P J Z X T N O I
I V B T C E H B A Z T I V N E I F N M E Z Q F T
Z H G O Z X S U K S A F R I T K N B Y H U F H I
U Z Q B C N G W H G K I O H U V J G F P W P P O
B N L A D J F D Q M Z C T C P T E B K H R J J N
W F U U W G B E U Y R I C A M H F O H O J F T P
F O X Q D M N E O D Y A U M O Z P P G R W I U M
U R H A E C S P C S N L D B C X S R E D N Q P I
S O N F O Z S B Y L Z U N B G S A E U W E V I Z
N B N Y O A N L E R I W O X B M H Q K L M R L Q
X U X U E G S U N I W N C K B D W R S C U G L K
L K D W S C D E P W I N T E L L I G E N C E I K
V E A H Q X S Y I Y Q D I R P E C N E I C S L V

Aquabot	Lilliput	Transformers	Sensors
Computer	Artificial	Recognition	Future
Hexbug	Conductor	Circuit	Technology
Machine	Humanoid	Deep blue	
Robots	Maths	Intelligence	
Engineering	Science	Program	

Hidden numbers

Can you find the numbers shown below in the grid?

2	5	6	1	8	5	6	3	0	4	8	3	6	1	6
7	2	8	7	6	5	3	2	8	0	8	5	8	1	8
3	0	2	3	1	3	5	0	5	5	4	8	7	5	5
2	2	9	0	8	3	4	5	2	0	9	6	2	0	8
4	8	5	7	4	3	3	3	3	4	5	2	4	9	8
4	8	6	6	9	2	6	1	9	8	4	1	5	0	5
4	7	8	5	1	0	0	0	2	1	5	1	4	6	1
7	0	5	6	5	4	1	8	0	9	0	6	9	0	3
9	0	5	4	4	4	5	9	7	7	0	3	3	3	4
1	9	5	3	9	2	7	4	2	3	5	2	9	5	0
0	9	8	9	6	4	9	7	9	8	0	5	9	2	0
3	2	2	9	4	2	5	5	0	0	6	3	9	0	0
3	8	7	1	2	6	0	0	0	0	8	2	1	6	5
9	6	5	4	9	8	7	2	5	2	0	6	8	0	1
4	3	6	2	3	4	7	0	8	9	9	1	0	1	3

130456	286554	410974	470085	561280	642950
150526	296684	433334	481973	567037	712600
253060	322942	436234	500043	572855	870099
270159	325326	444791	520680	588586	896497
280858	399918	454908	549872	592884	991013

Hidden words

During lockdown the children below had fun making hideouts at home. Whilst playing they uncovered six hidden words around the room, can you spot them? Some hints are shown in the box below if you get stuck, good luck.



Hints

- A five letter word is resting on an armchair
- A five letter word is stuck in the hairs of the broom
- A six letter word disguises itself as embellishment for something that hangs on the wall
- A three letter word hides in the cat's fur
- Don't get tangled in this four letter word behind the TV
- This five letter word has travelled all the way to the kitchen

Battleships game

How to play

This game can be played either by two children or with adults. Print two sheets of this game and give one to each person along with a pen or pencil. The players should place all of the ships on their grid by drawing an outline of each onto the grid according to its size (e.g: size 3 = 3 blocks). Ships may not overlap. The players shouldn't see the ships of another player. You should take turns firing your enemy by calling out the location on the grid, like B-4, J-3 etc. and mark hit with a cross "X" and miss with a dot "." on the enemy's ship grid. When the enemy fires upon another player that player should say "hit" or "miss", the player should also then mark his or her ships with an X when they are hit. When a player's ship is sunk, that player must say, "You sank my ____!" (with the name of his or her ship type). The first person to sink all of their enemy's ships wins!

My fleet

A										
B										
C										
D										
E										
F										
G										
H										
I										
J										
	1	2	3	4	5	6	7	8	9	10



Aircraft Carrier



Battleship



Cruiser



Submarines x 2



Destroyer x 2

Enemy's fleet

A										
B										
C										
D										
E										
F										
G										
H										
I										
J										
	1	2	3	4	5	6	7	8	9	10



Aircraft Carrier



Battleship



Cruiser



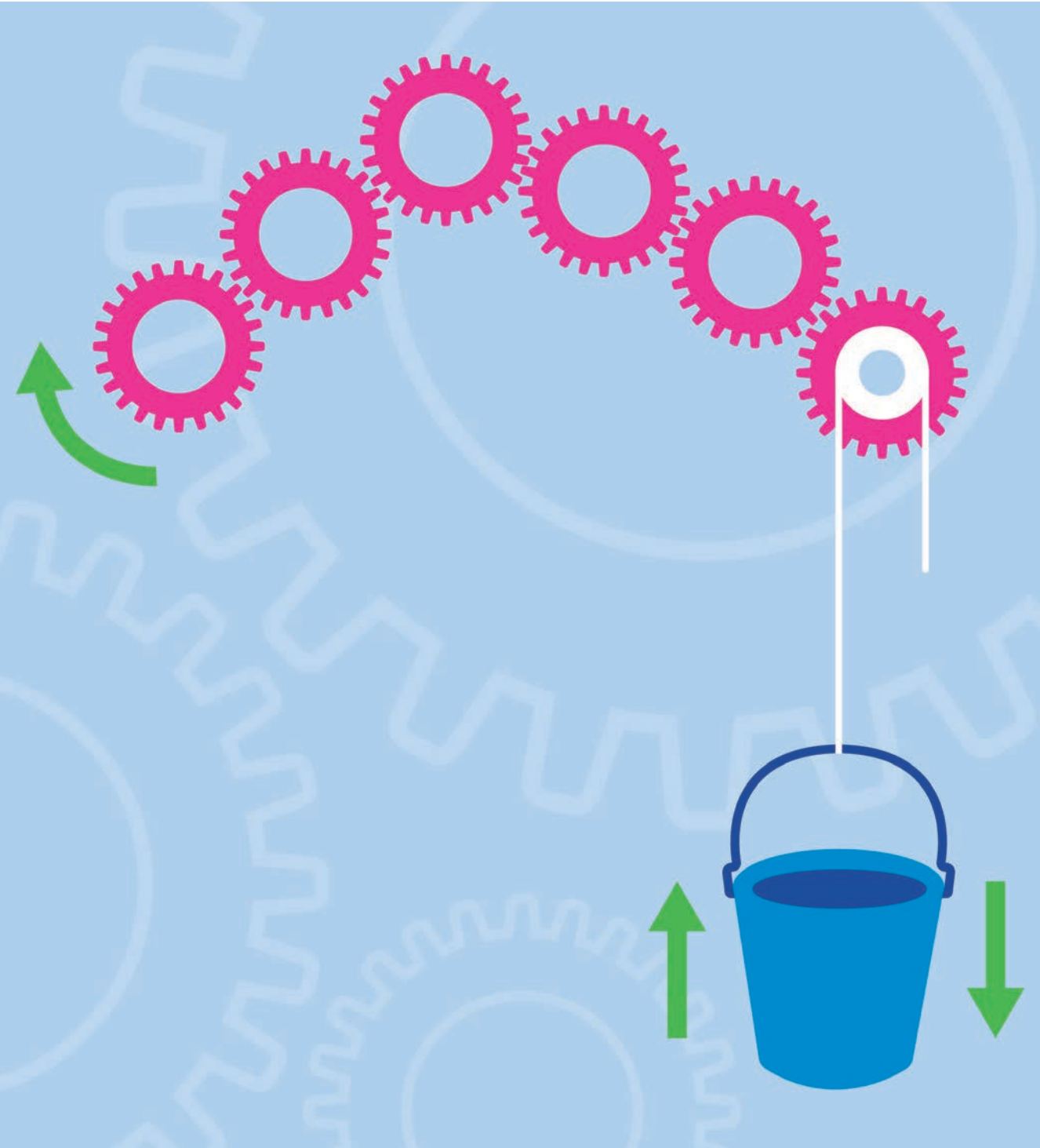
Submarines x 2



Destroyer x 2

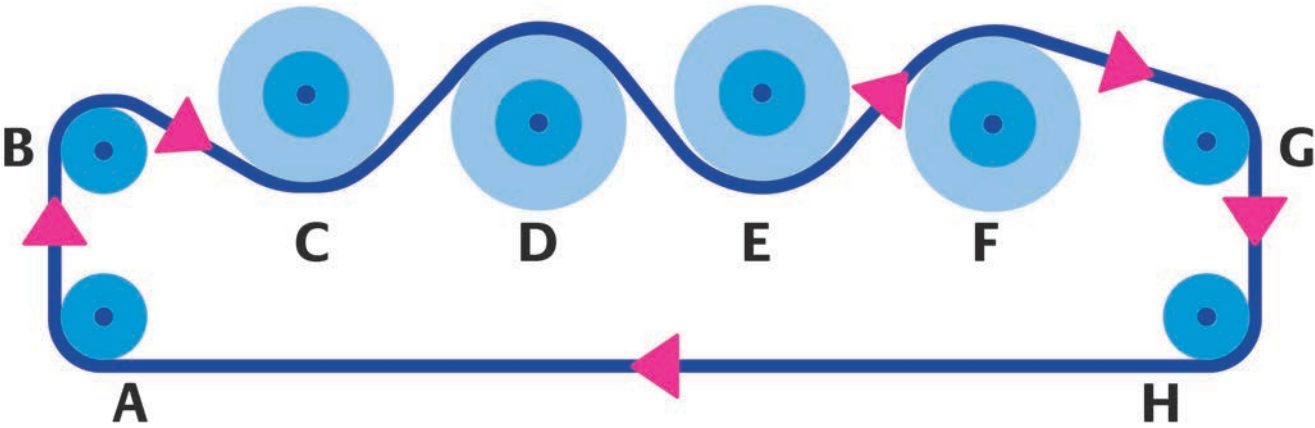
Can you help the water engineer?

The water engineer is trying to work out if the gear wheel on the far left is rotated in the direction of the arrow. Will the bucket go up or down? Can you work it out?



Can you think like an engineer?

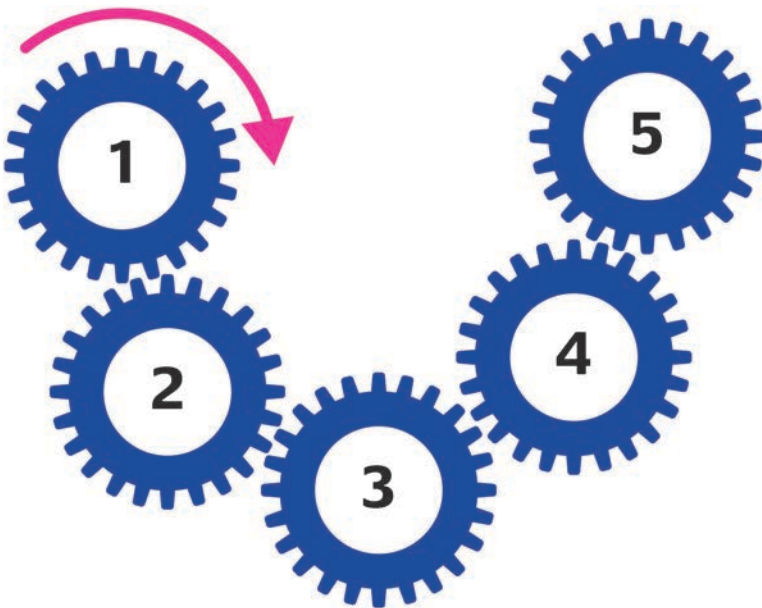
Question 1: If the cable runs in the direction of the arrows, how many pulleys are turning clockwise?



Would it be? A. 0 B. 4 C. 6 D. 8

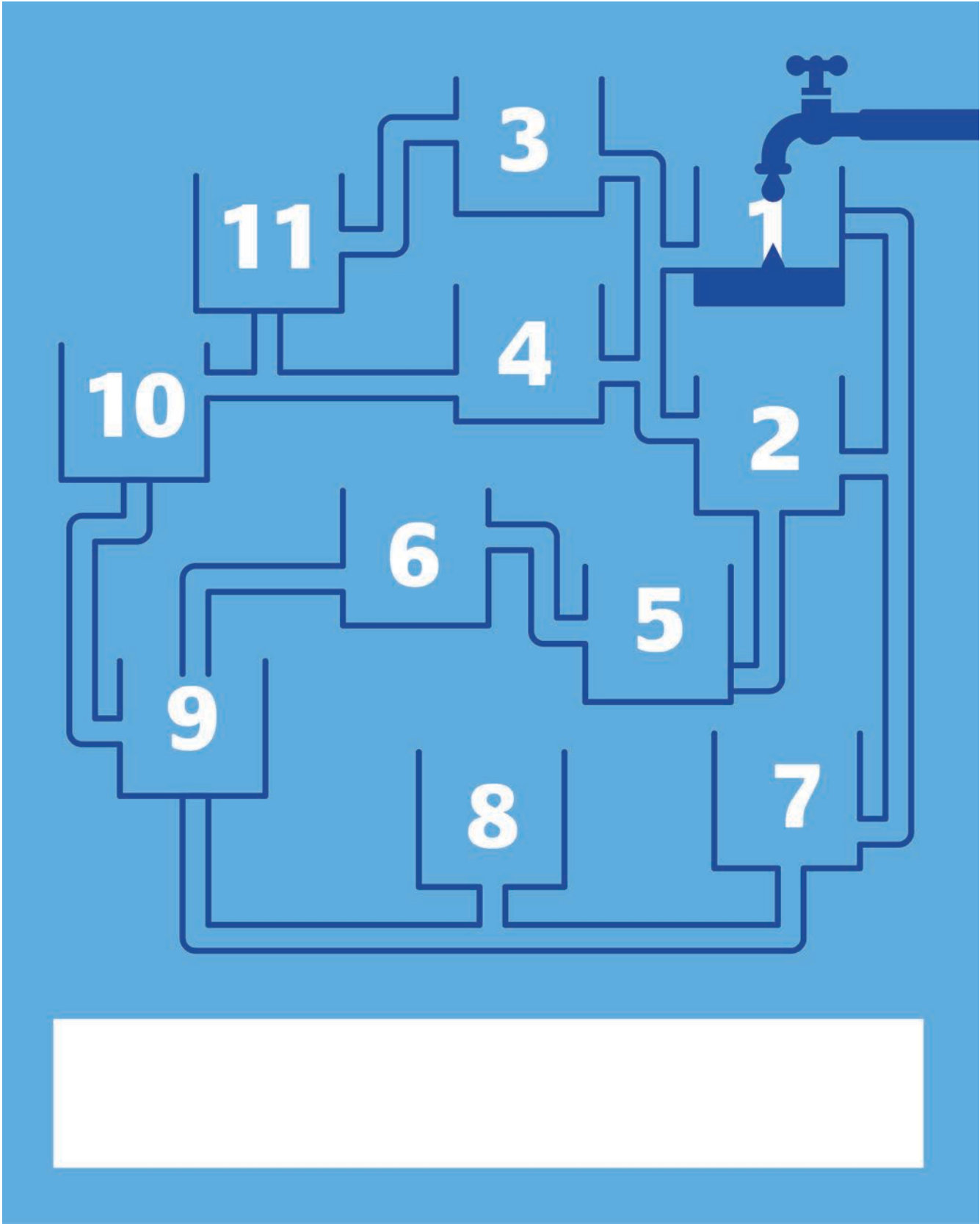
Question 2: If wheel 1 turns clockwise, which wheels will turn anti-clockwise?

- A. 3 and 5
- B. 2 and 4
- C. 3 and 4



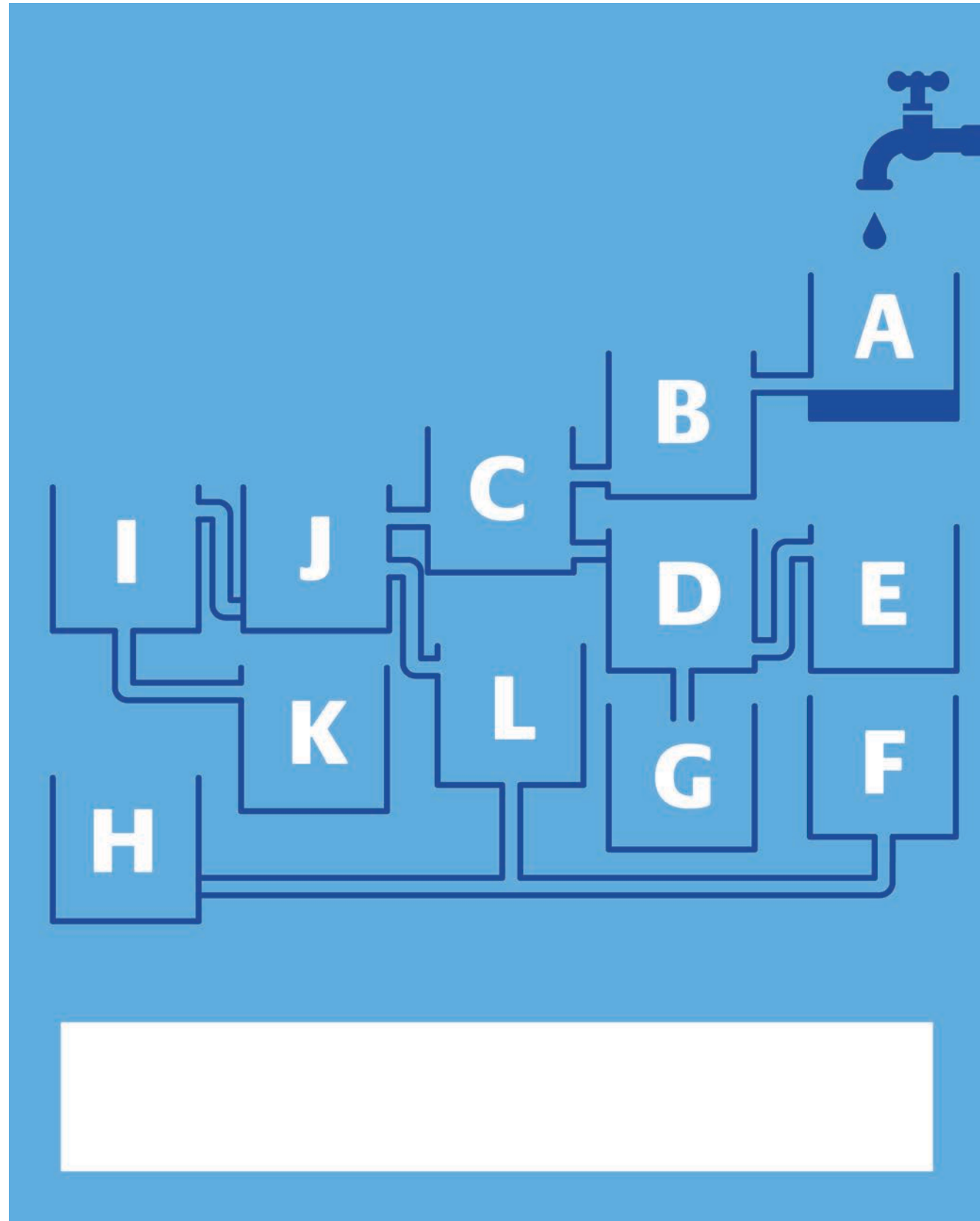
Water tank filling 1

Which tank will fill up first? Write your answer in the box below.



Water tank filling 2

Which tank will fill up first? Write your answer in the box below.



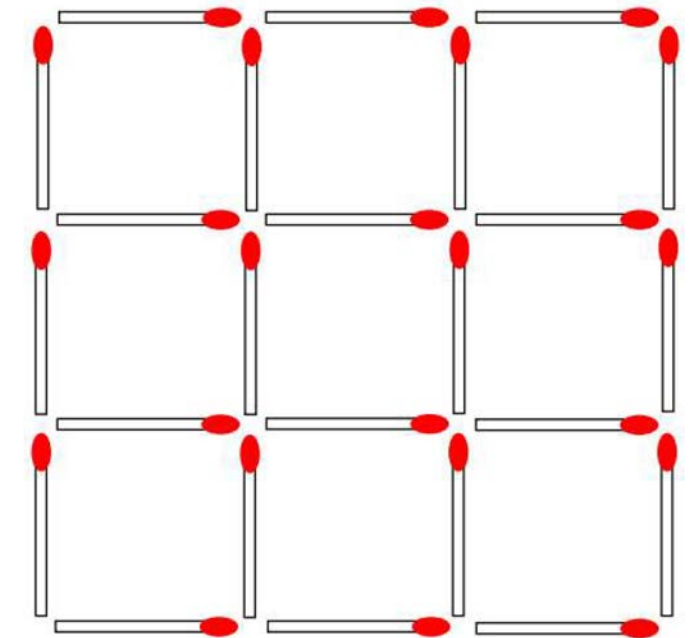
Matchstick puzzles

For these puzzles you will need either matchsticks (with adult permission), or drinking straws or spaghetti (cut into equal lengths).

Puzzle 1 - Make two

For this puzzle we need 24 matches/pieces of spaghetti/straw to make up this 3x3 pattern.

Once you have made the pattern, can you take away 8 pieces to leave just two squares?



Puzzle 2 - Leave six

Make up the same grid pattern as before.

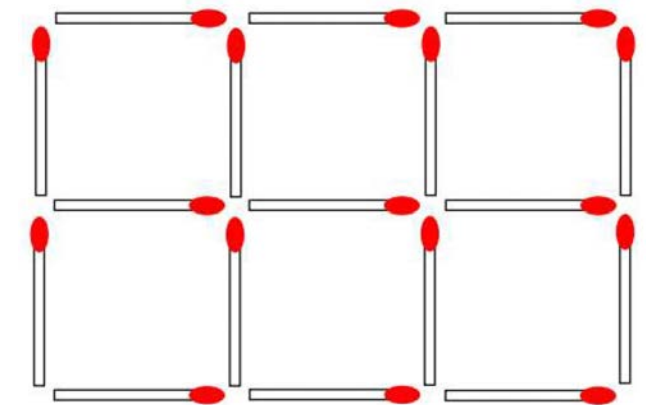
This time can you take away 8 pieces to leave just six squares?

Puzzle 3 - Leave six

For this puzzle you will need
17 pieces to make up this 3x2
pattern.

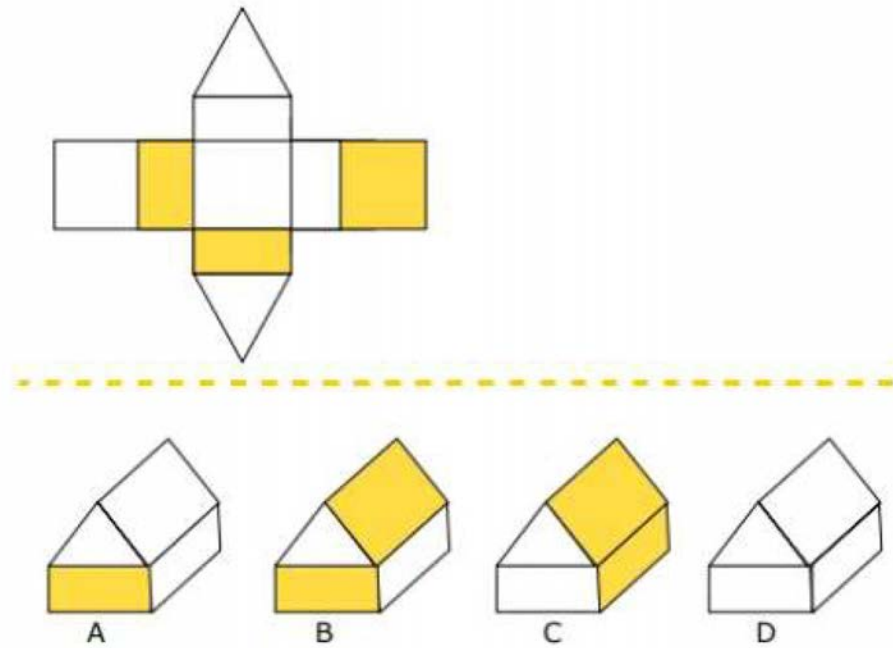
Once you have made the pattern
can you take away 5 pieces to
leave just three squares?

And no odd pieces left sticking out anywhere please!!

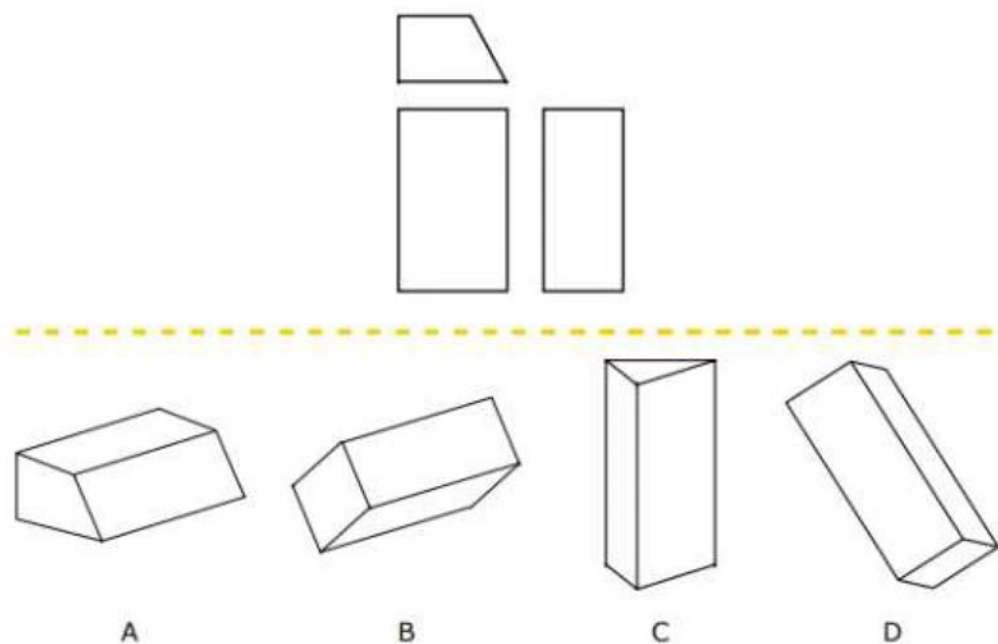


Mechanical reasoning

Question 1: When you fold this paper to build a house can you determine which house the paper will create A, B, C or D?

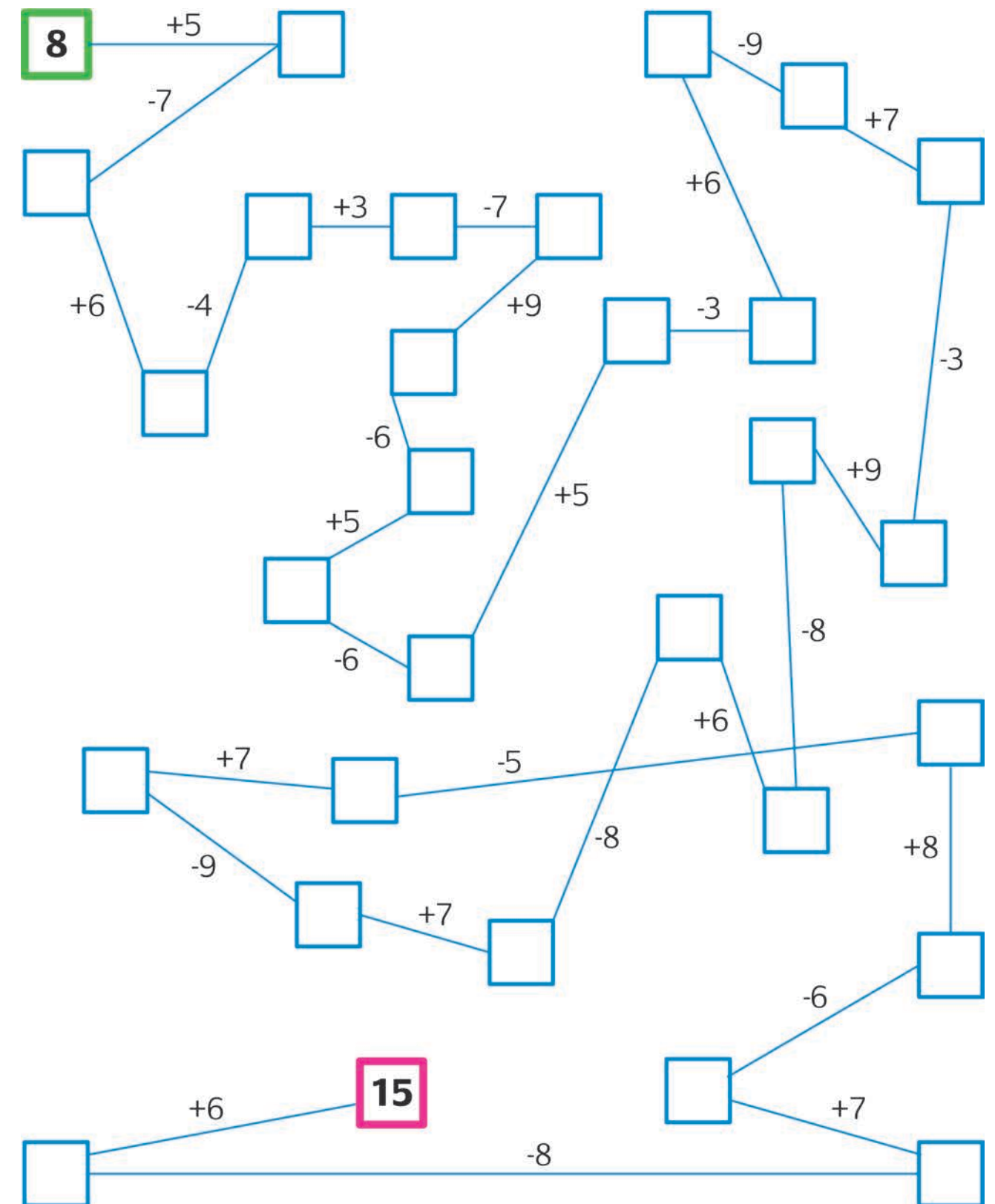


Question 2: Which figure could be assembled using each of the provided pieces?



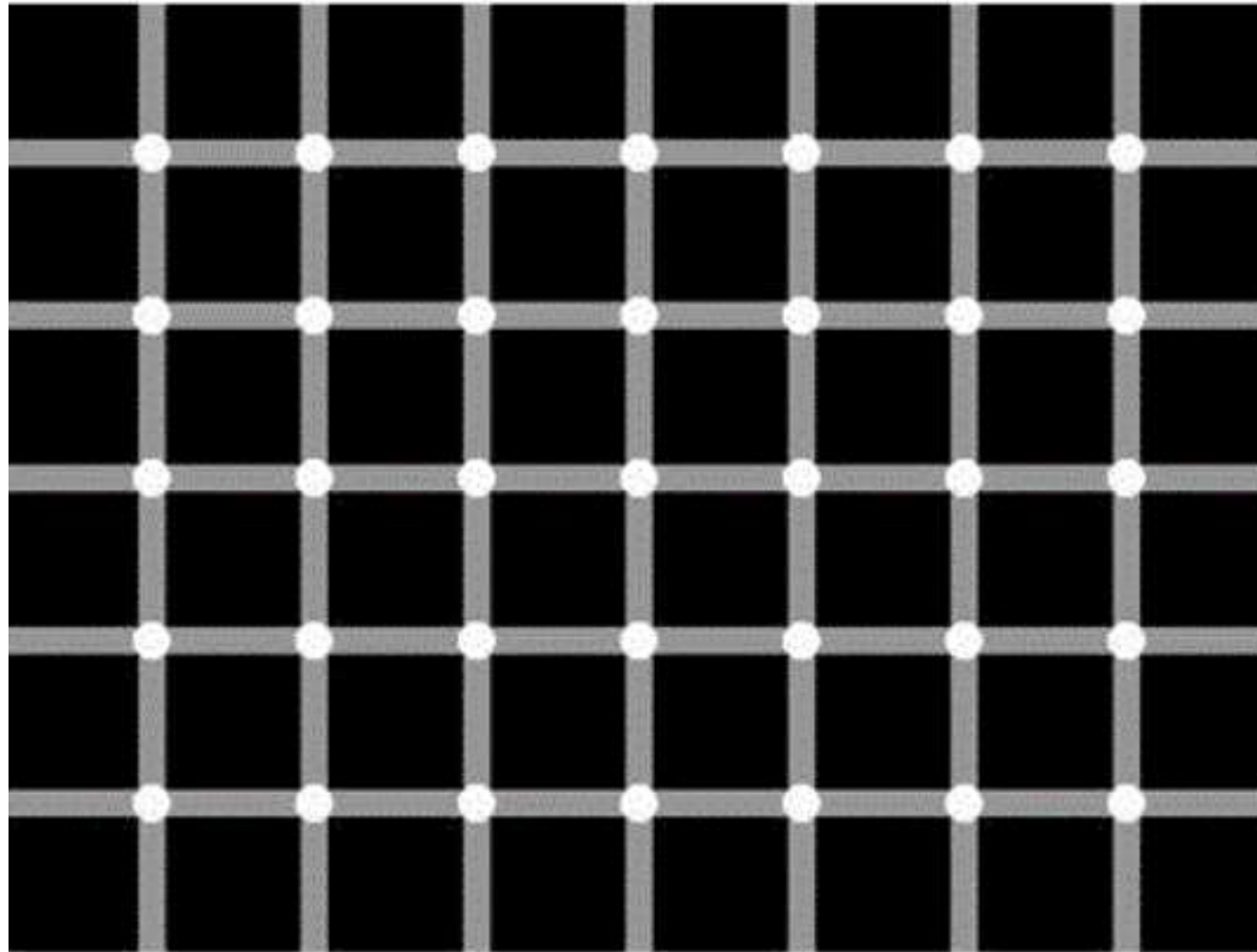
Maths zig zag

Can you do the maths and fill in all the empty boxes to reach the end?



Grid illusion

Count all the black dots you can see

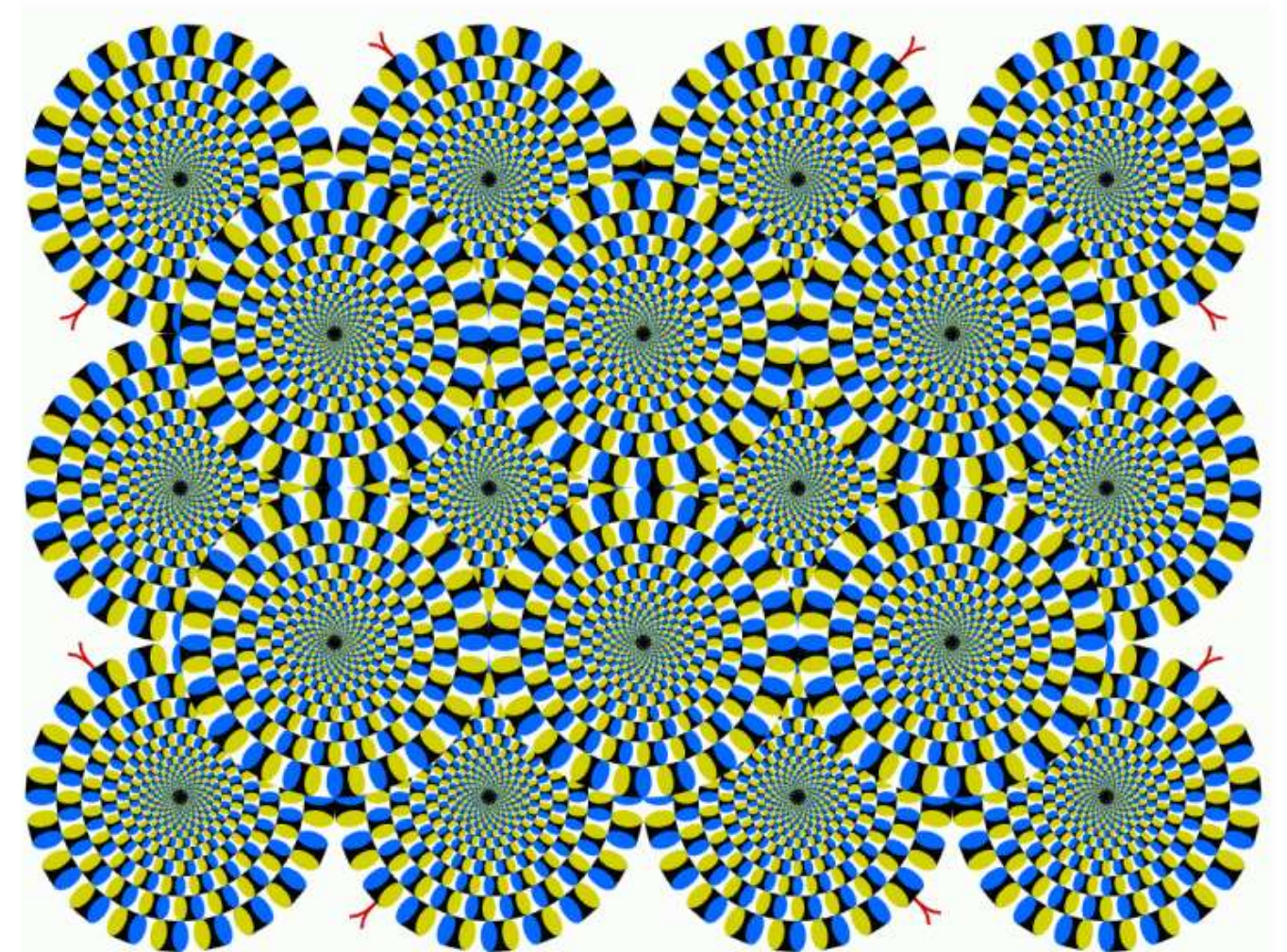


Optical illusion

Look straight at the pattern, don't blink and watch the circles move!

What is an optical illusion and how does it work?

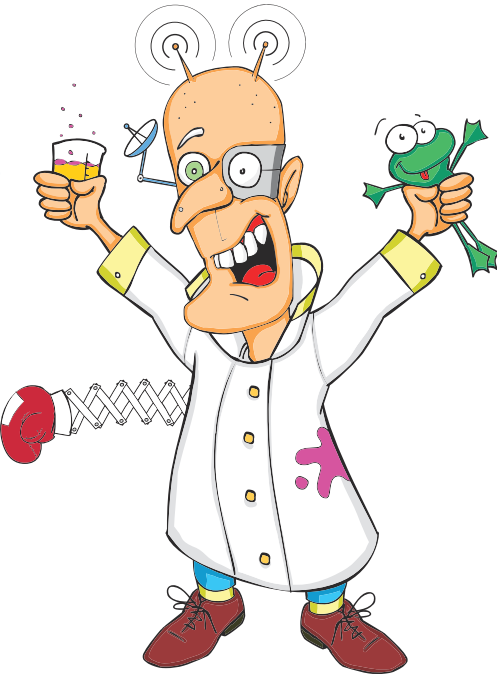
Optical illusions can use colour, light and patterns to create images that can be deceptive or misleading to our brains. The information gathered by the eye is processed by the brain, creating a perception that in reality, does not match the true image. Perception refers to the interpretation of what we take in through our eyes. Optical illusions occur because our brain is trying to interpret what we see and make sense of the world around us. Optical illusions simply trick our brains into seeing things which may or may not be real.



Create your own optical illusion

Crazy scientist Nige will guide you through the very simple process to create your very own optical illusion. The way this optical illusion works is that you will be able to see the cubes in two different ways. Your brain will switch to how you see the cubes to going outward, or going inward. You can often switch views blinking.

Before starting you will need a copy of the blank grid below and some colouring pens or pencils. Ideally you will have to make three different shades of one colour (medium, dark and light).



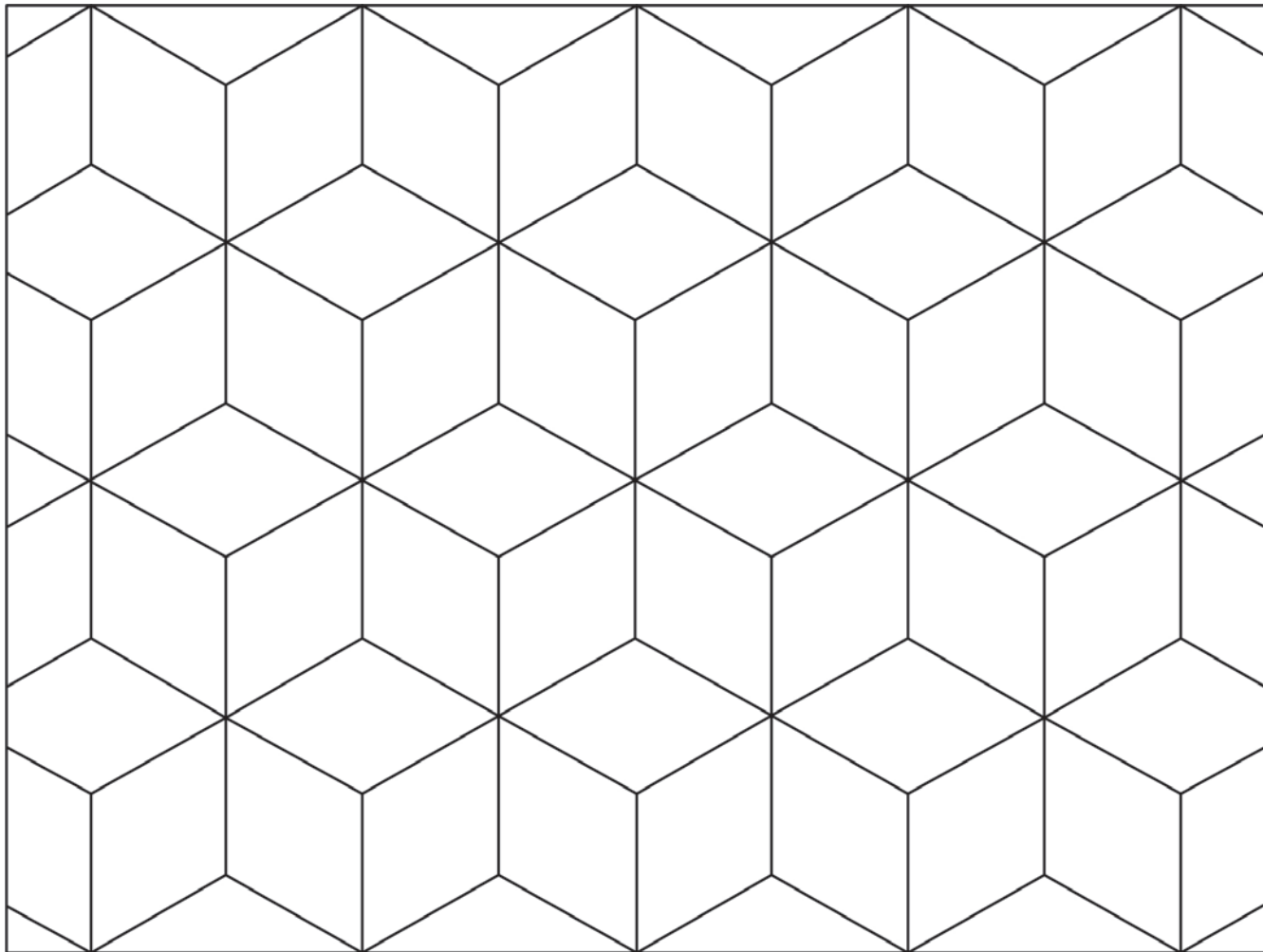
Medium

Dark

Light

I shall use blue, but you can use whatever colours you like.

Top tip: If you don't have colours you could use black, grey and white.



Dark

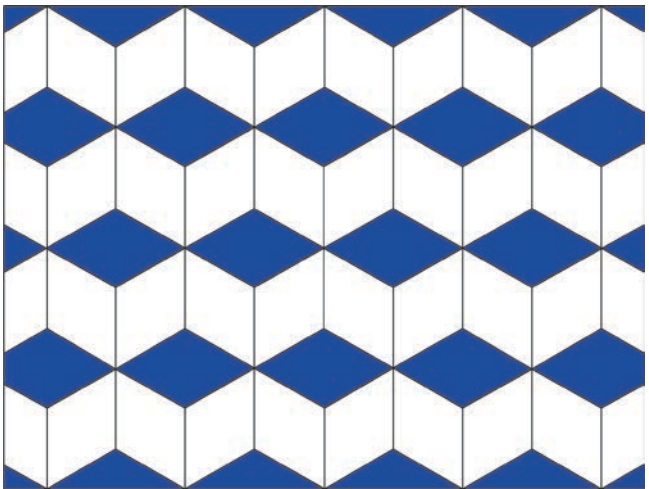
If you have everything you need, we can now get started on the fun part, to create the illusion.

Firstly, you will need the 'dark' shade of your chosen colour, this will form the top of your cubes.

The first bit can be tricky to start with, but it is a pattern so you will soon get the hang of it.

Also, you may find that your eyes play tricks on you while you are drawing.

You should now have a grid looking like mine. The parts you have coloured in represent the top of the cube on one view of the optical illusion, and the bottom on the other.



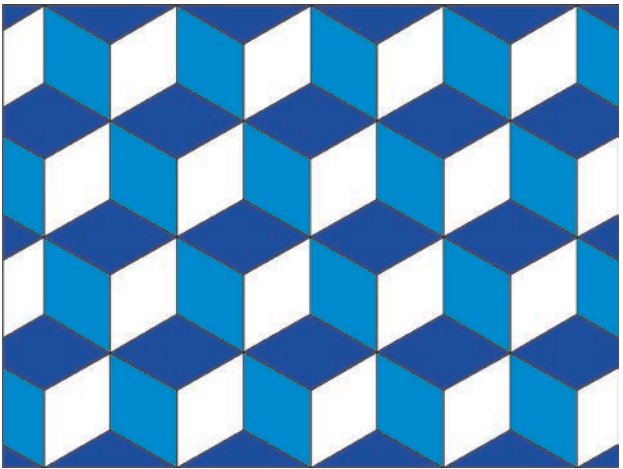
Medium

Next we need the 'medium' shade of your colour to go on the left hand side of your cubes.

Are you still with me? That's great.

You should now have a grid looking like mine.

The parts you have coloured in represent the left side of the cubes in one view, and the right in the other view.



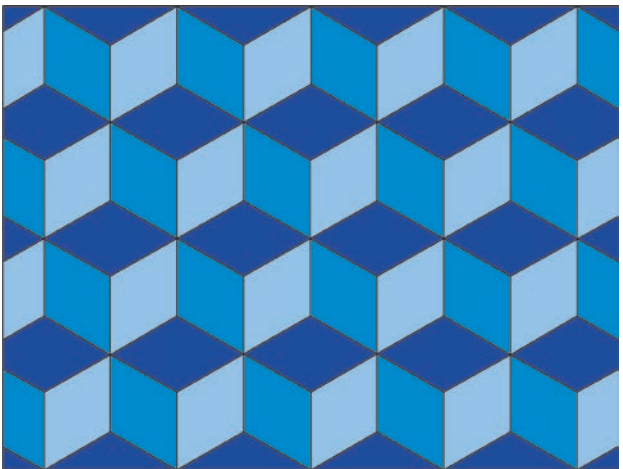
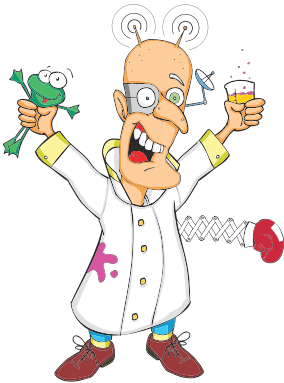
Light

Finally, you will need the 'light' shade of your chosen colour to go on the right-hand side of your cubes.

And the parts you have just coloured in represent the right view.

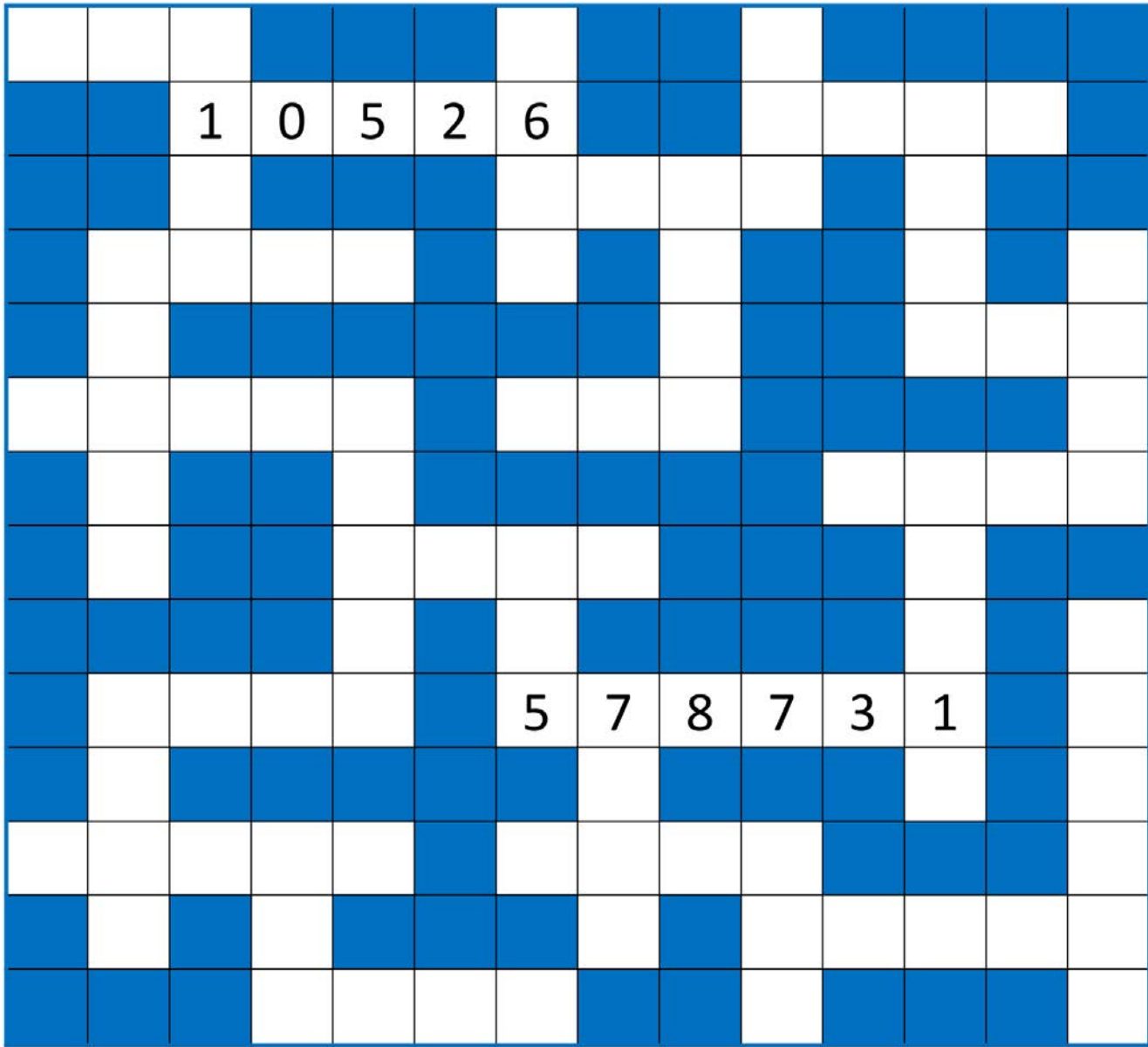
And there you have it! A simple optical illusion of cubes to fool your brain.

I hope you have enjoyed our little venture into optical illusions and if you really want you can play around with different shades, colours and effects to make some really cool illusions for yourself, have fun.



Number fill in

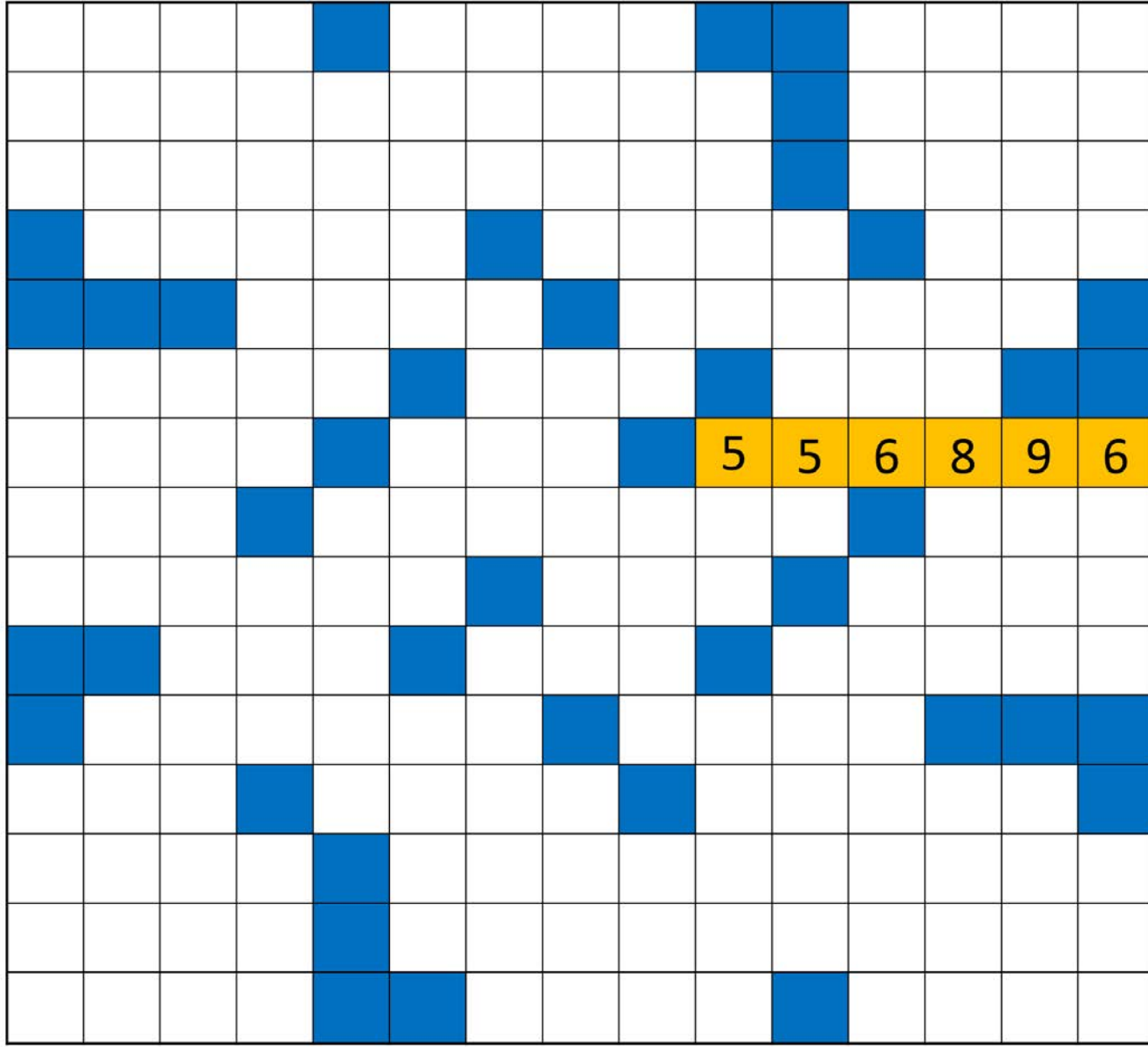
Work out which of the numbers goes in each space in the puzzle below. Two of the numbers have been done for you.



3 Digits	4 Digits	5 Digits	6 Digits
132	1364	6874	7210
195	1679	7482	7729
349	1875	8416	9168
457	2146	9628	
471	2951		
551	5074		
729	5673		
834	6219		

Number fill in

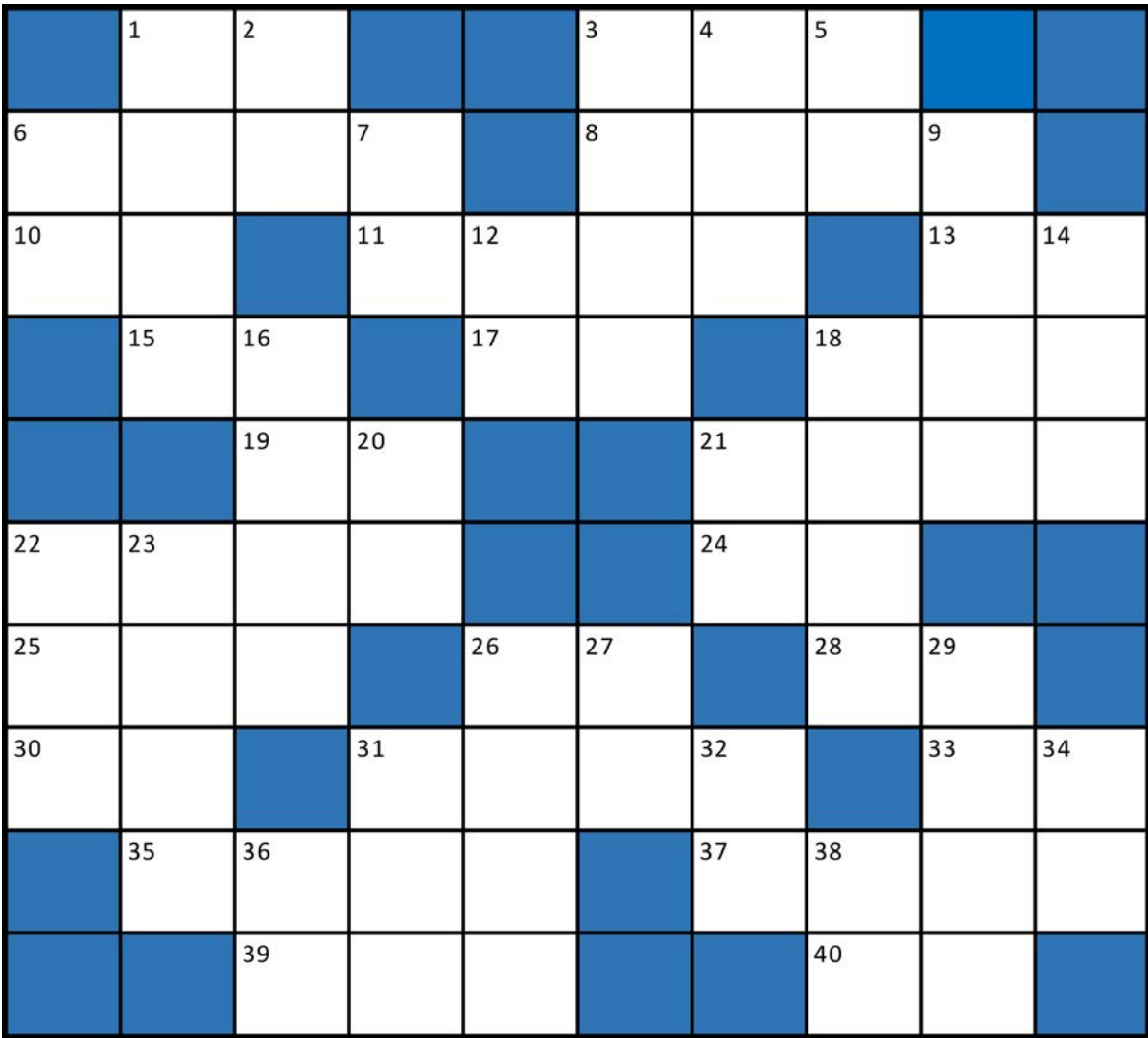
Can you fill the numbers shown below into the grid? We have given you the first number in the grid to give you a head start. Fill in the numbers from the list where they will fit and check off each number as you go.



3 Digits	4 Digits	5 Digits	6 Digits	7 Digits	10 Digits
078	446	3435	6762	59055	2327354
105	516	0231	6925	67456	3733182
133	544	0254	7075	07314	6754147
158	558	1258	7151	15616	155581
178	588	1346	7169	34206	518390
186	616	1440	7346	39863	556896
299	629	1532	7561	43341	1688094379
367	643	2163	7690	49404	4388156554
370	656	2375	8297	52765	4445868653
377	784	3152	8383	54323	5053197245
		3432	9294	57929	6037221282
					6762508981

Number crossword

Can you complete the number crossword by solving the mathematic clues below?



Across

1. 22 – 9

3. 159 – 13

6. 465 + 750

8. 2329 + 3294

10. 25 – 10

11. 18833 – 9266

13. 20 – 7

15. 15 + 16

17. 120 – 24

18. 952 – 344

19. 99 – 40

21. 445 + 8975
22. 1496 + 930

24. 124 – 46

25. 1290 – 300

26. 98 – 44

28. 11 + 5

30. 27 + 40

31. 9284 – 2589

33. 44 – 10

35. 3292 – 768

37. 9 + 1616

39. 858 – 356

40. 1 + 10

Down

1. 710 + 543

2. 46 – 15

3. 297 + 1269

4. 235 + 232

5. 83 – 21

6. 15 – 4

7. 29 + 30

9. 5457 – 2355

12. 24 + 35

14. 560 – 180

16. 381 + 1139

18. 12346 – 5865
20. 27 + 69

21. 183 – 86

22. 338 – 42

23. 280 + 4692

26. 10786 – 5144

27. 27 + 22

29. 12200 – 5879

31. 687 – 67

32. 62 – 11

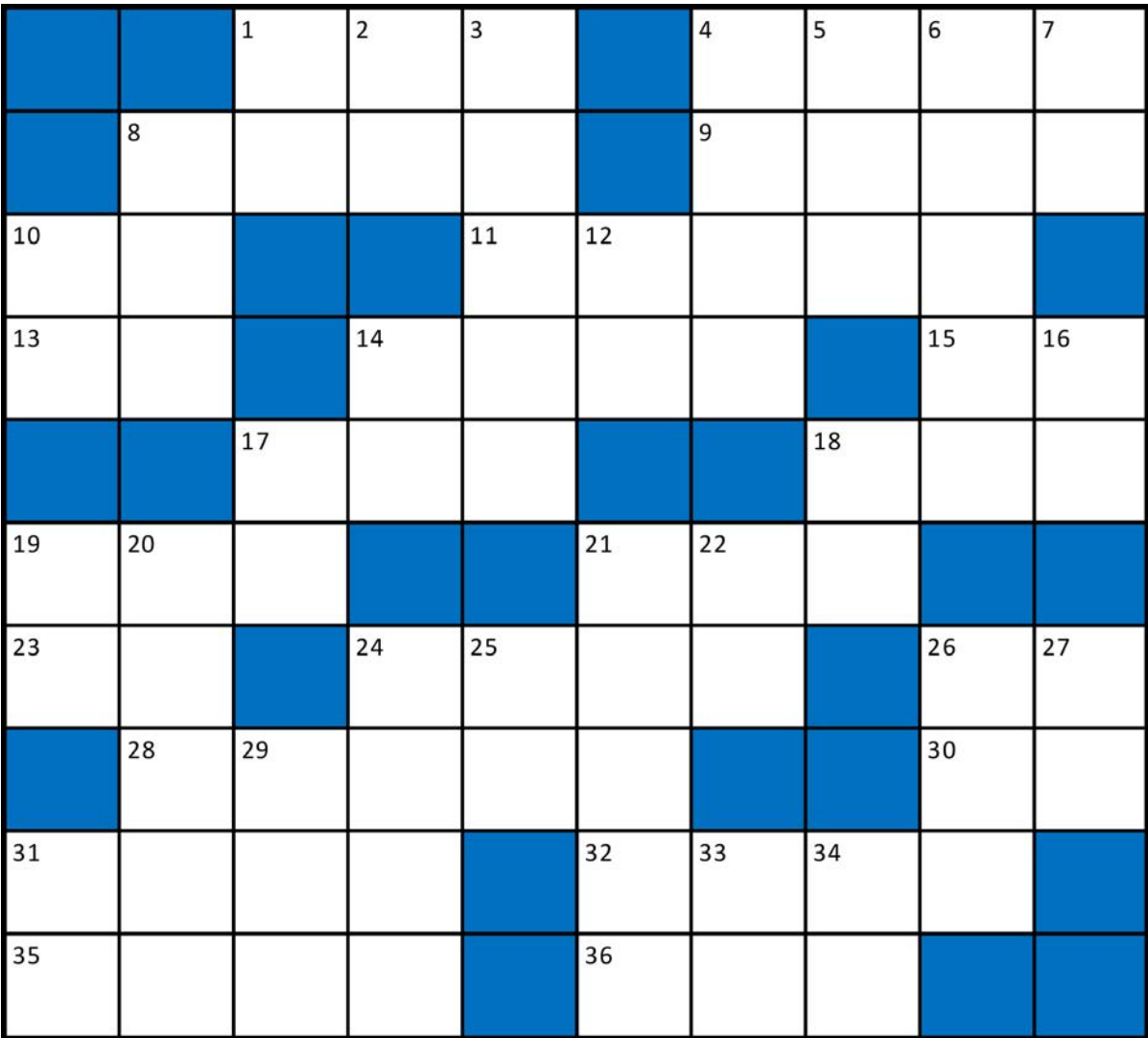
34. 21 + 24

36. 61 – 6

38. 17 + 44

Number crossword

Can you complete the number crossword by solving the mathematic clues below?



Across

1. 1408 – 427

4. 1627 + 6068

8. 601 + 3466

9. 6046 – 2918

10. 9 + 18

11. 84863 – 2084

13. 24 + 21

14. 2109 + 7810

15. 58 – 4

17. 420 – 105

18. 40 + 946
19. 219 + 501

21. 499 – 15

23. 2 + 37

24. 401 + 2294

26. 28 + 53

28. 23833 – 11720

30. 62 – 5

31. 328 + 1133

32. 10074 – 261

35. 2826 + 3220

36. 142 + 442

Down

1. 172 – 82

2. 115 – 29

3. 27929 – 10034

4. 4734 + 2645

5. 138 + 479

6. 90348 + 2610

7. 105 – 47

8. 779 – 304

10. 1 + 23

12. 2 + 19

14. 20 + 71
16. 9 + 37

17. 20 + 10

18. 167 – 73

19. 1 + 72

20. 25695 + 3445

21. 70644 – 21249

22. 21 + 64

24. 1300 + 816

25. 110 – 49

26. 1207 – 354

27. 1 + 16
29. 54 + 210

31. 1 + 15

33. 50 + 38

34. 5 + 9

Addition crossword

Fill in the yellow blanks of each crossword puzzle to make the addition equations true.

[illegible]

Subtracting decimals crossword

Subtract the decimals below and complete the crossword.
Remember to line up the decimal points!

Across

2. $624.7 - 219.5$
4. $834.2 - 185.9$
7. $401.2 - 190.7$
8. $285.1 - 136.2$
9. $358.4 - 230.5$

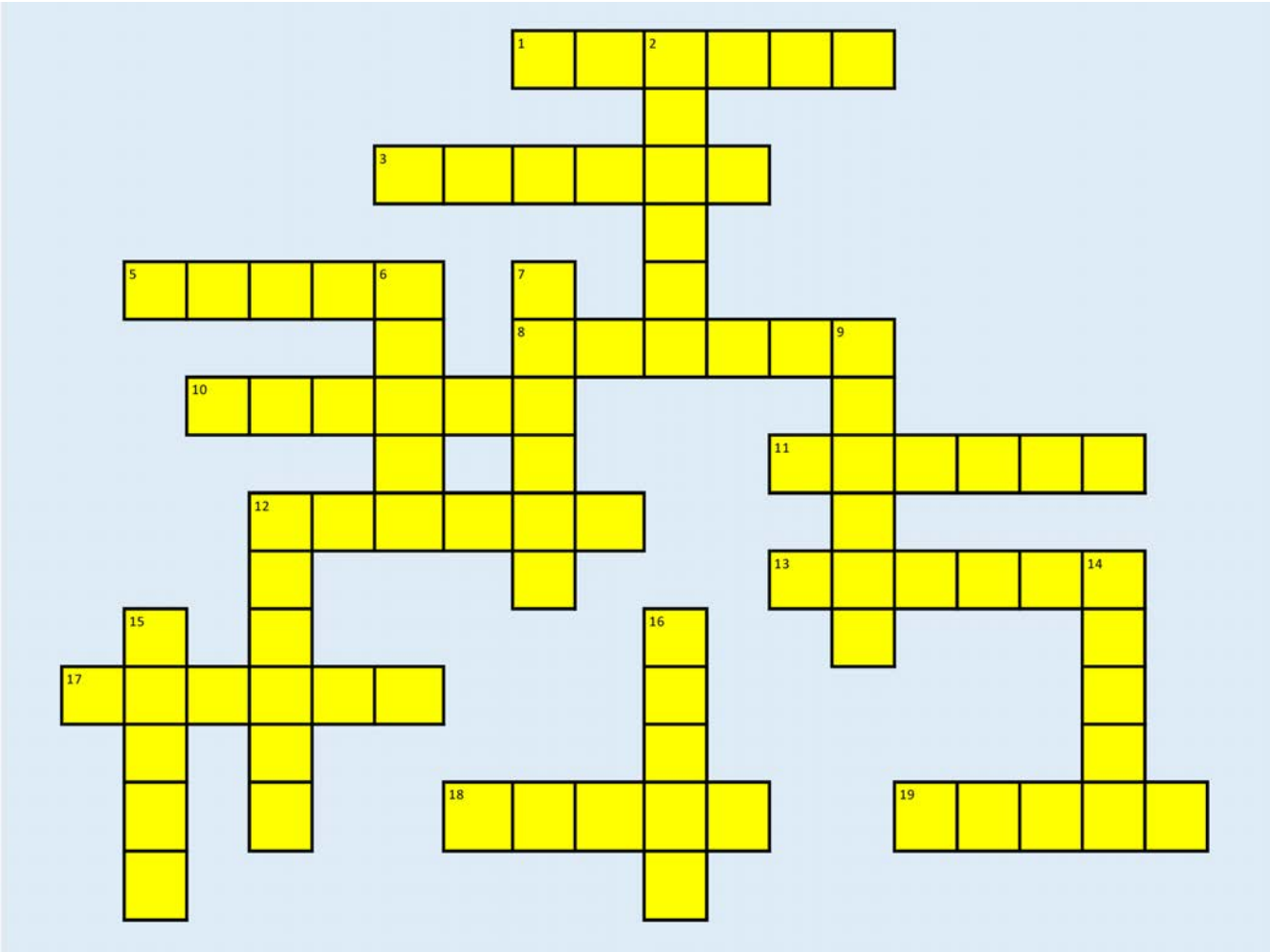
Down

1. $825.0 - 368.4$
2. $821.4 - 380.5$
3. $734.4 - 521.5$
4. $109.3 - 47.6$
5. $312.6 - 156.8$

- 6.** $340.2 - 132.3$
- 8.** $175.8 - 63.7$
- 11.** $546.2 - 270.8$
- 13.** $751.2 - 264.7$
- 14.** $429.4 - 383.7$

Decimals addition crossword

Add the decimals below and complete the crossword.
Remember to line up the decimal points, and all numbers are to two decimal places!



- Across**

1. 59.29 + 82.68

3. 63.41 + 74.28

5. 32.83 + 43.92

8. 19.04 + 82.37

10. 83.53 + 39.41

11. 62.18 + 59.32

12. 89.45 + 26.75

13. 67.27 + 94.38

17. 94.50 + 39.37

18. 52.38 + 41.65

19. 12.97 + 42.90
- Down**

2. 48.02 + 68.29

4. 91.53 + 50.97

6. 29.43 + 30.53

7. 71.04 + 43.23

9. 92.35 + 30.25

12. 76.49 + 53.64

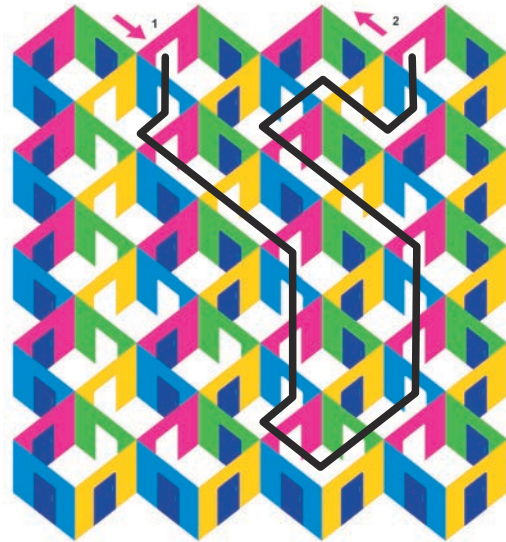
14. 13.75 + 37.63

15. 53.23 + 29.84

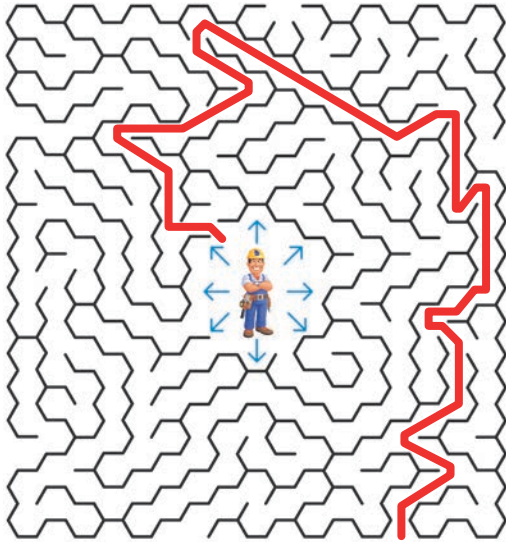
16. 38.54 + 19.53

Answers

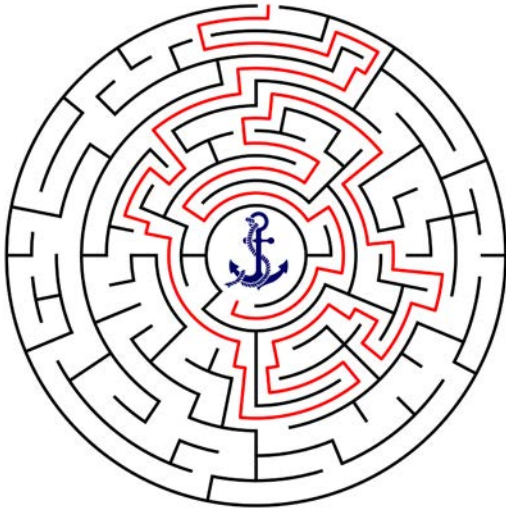
Pg 14. Maze game: Doors



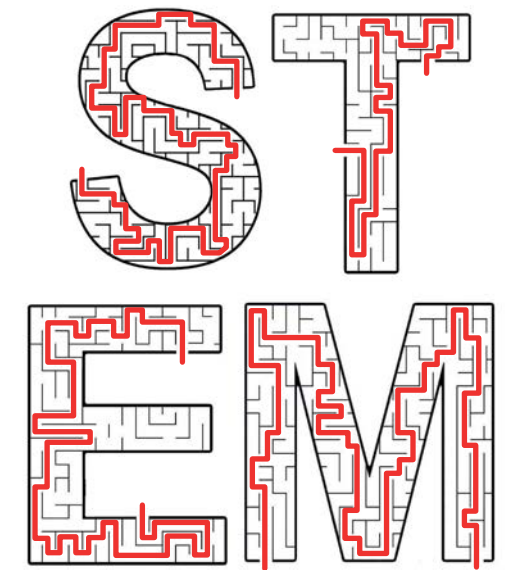
Pg 15. Maze game: Ship escape



Pg 16. Maze game: Ship & anchor



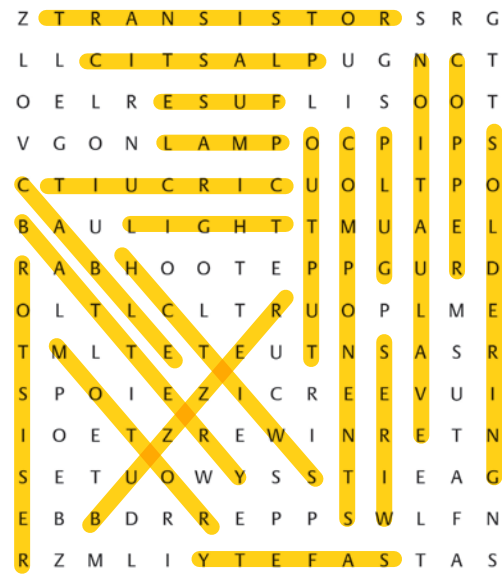
Pg 17. Maze game: STEM



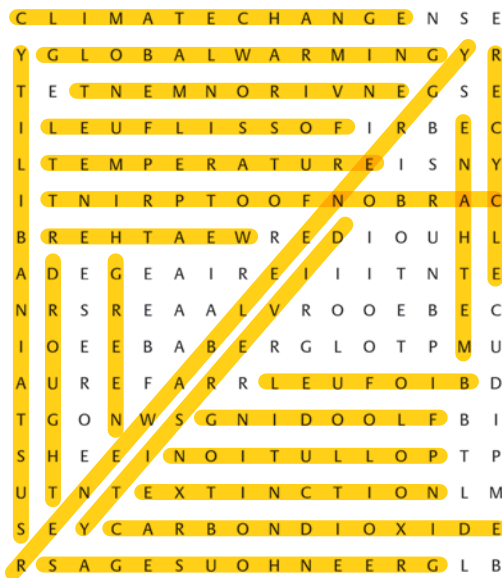
Pg 18. Maze game: Prime number

85	65	30	65	60	41	22	18	46	8	21	38
12	58	80	82	30	83	82	88	45	68	36	35
78	79	2	83	73	37	18	60	85	35	49	27
9	71	14	60	16	70	54	72	52	60	70	76
30	59	7	43	72	82	63	85	22	10	75	69
30	56	69	41	12	10	80	10	39	87	86	12
12	9	9	83	59	14	5	37	73	9	51	66
52	27	50	30	83	61	31	69	3	47	59	83
74	60	60	72	55	44	45	30	42	30	52	53
51	69	10	12	28	18	12	9	85	12	82	17
82	70	84	38	60	18	42	18	18	32	77	73
66	14	22	63	80	39	65	60	60	55	60	53
45	60	38	69	74	30	30	60	87	14	3	47
12	60	39	74	12	52	50	38	68	89	29	69
42	55	39	68	52	9	33	60	71	29	12	14
26	54	60	84	12	38	9	74	37	77	10	21
30	30	60	84	12	38	9	74	2	33	44	58

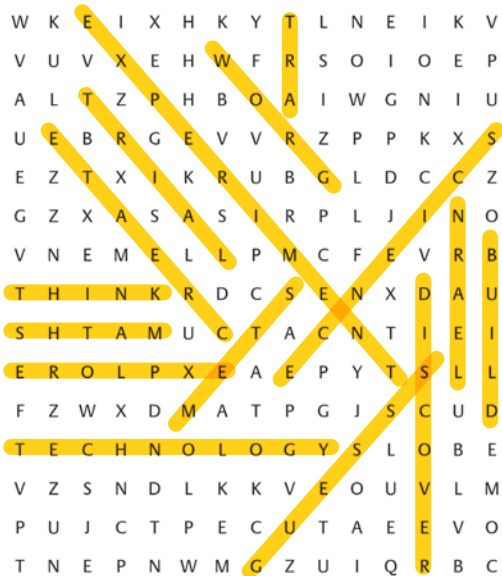
Pg 19. Wordsearch: Electronic components



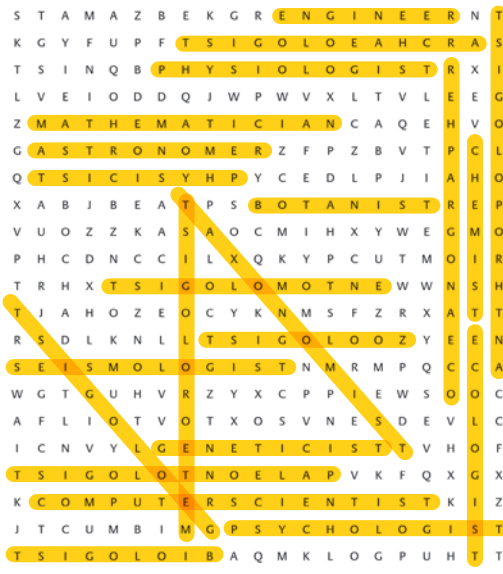
Pg 20. Wordsearch: Climate change



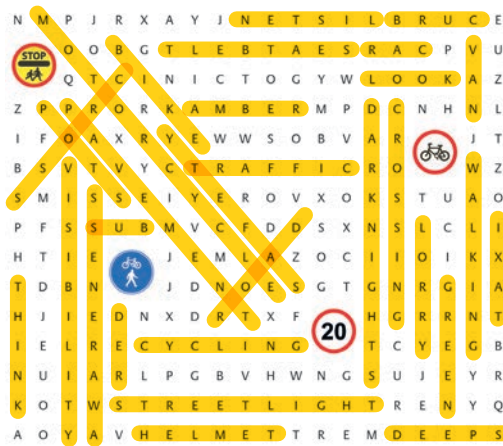
Pg 21. Wordsearch: STEM



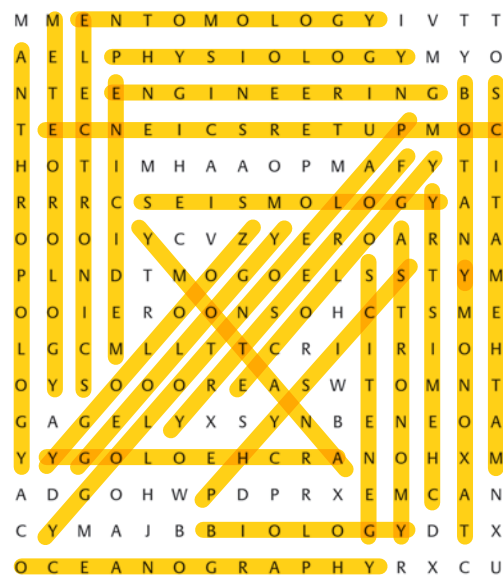
Pg 22. Wordsearch: STEM Jobs



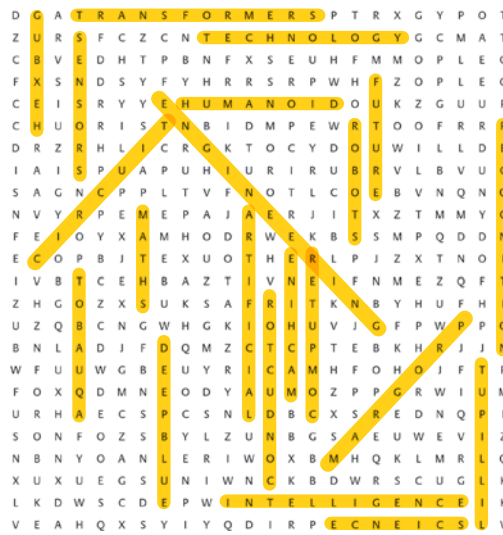
Pg 23 Wordsearch: Road safety



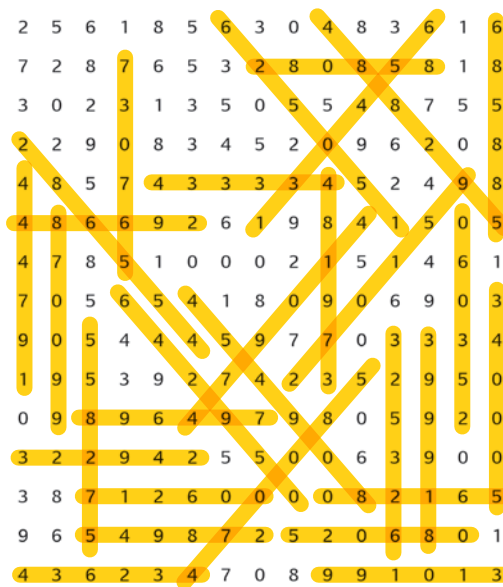
Pg 24. Wordsearch: The Sciences



Pg 25. Wordsearch: Introduction to robotics



Pg 26. Hidden numbers



Pg 27. Hidden words



Pg 29. Can you help the Water Engineer?

The bucket will move down

Pg 30. Can you think like an Engineer?

Question 1: The answer is C. Wheels A, B, D, F, G, & H are all moving clockwise due to the motion of the belt.

Question 2: The answer is B

Pg 31. Water tank filling 1

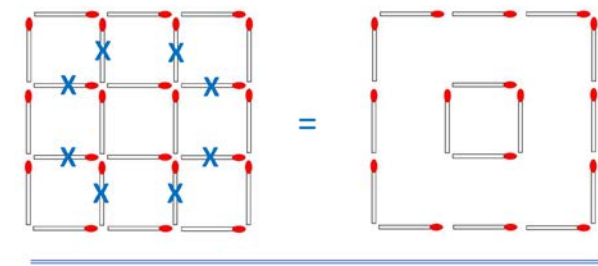
Tank 8 will fill up first. The water will travel from 1 to 2 to 7 to 8. Other paths are blocked off.

Pg 32. Water tank filling 2

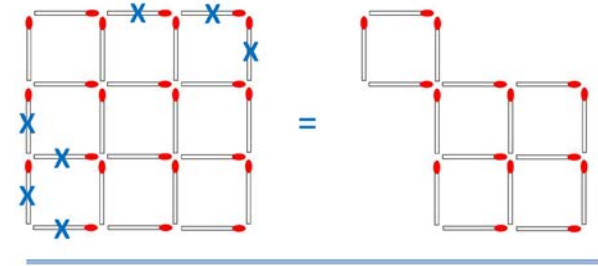
Tank F will fill up first. D, E & G will never fill up because the inlet pipe for D is blocked. So C will start filling J. Tank I will only start filling up if & when J fills up, before of which L will start filling up. The water from L flows into pipes leading to F & H, but H won't fill up because it's input pipe is blocked. Therefore F tank will fill up first.

Pg 33. Matchstick puzzles

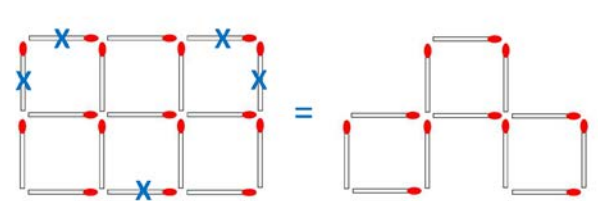
Puzzle 1 Solution - this is how to do it!



Puzzle 2 Solution -

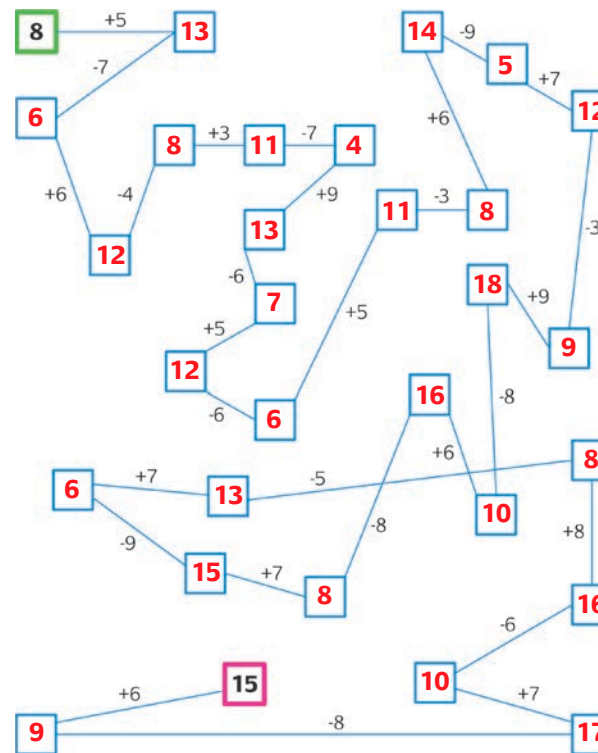


Puzzle 3 Solution -



Quite an easy one, hope you got it without looking at the solution first!

Pg 35. Maths zig zag



Pg 34. Mechanical reasoning

Question 1: The answer is B, because whether you are folding it upward or downward, you must have a coloured wall and a coloured roof. However, you can't have them at the same side.

Question 2: The answer is A.

Pg 36. Grid illusion

There are no black dots.

If you focus directly on each dot, you'll see that all of them are white. Your eyes and brain are tricking you, try this on Mum, Dad and your friends.

Pg 40. Number fill in

1	3	2				9			4					
		1	0	5	2	6			7	2	1	0		
		4				2	9	5	1		3			
	5	6	7	3		8		0			6		7	
	9							7			4	5	7	
6	4	3	2	5		8	3	4						2
	2			7							1	6	7	9
	3				8	4	1	6				3		
				0		9						4		6
	6	2	1	9		5	7	8	7	3	1			4
	8						4					0		7
1	7	5	3	8		1	8	7	5					9
	4		4				2		5	9	2	4	8	
			9	1	6	8			1					2

Pg 41. Number fill in

6	7	6	2		5	0	8	9			1	4	4	0
5	0	5	3	1	9	7	2	4	5		3	4	3	2
6	7	6	2	5	0	8	9	8	1		3	4	3	5
	5	2	7	6	5		7	6	9	0		5	4	4
			3	1	5	2		1	5	5	5	8	1	
6	7	4	5	6		1	0	5		6	1	6		
6	1	3	4		3	6	7		5	5	6	8	9	6
5	5	8		3	7	3	3	1	8	2		6	2	9
5	1	8	3	9	0		1	5	8		6	5	9	2
		1	7	8		6	4	3		5	7	3	4	5
	5	5	7	6	7	5		2	3	7	5			
4	4	6		3	5	6	8		4	9	4	0	4	
6	3	5	1		6	0	3	7	2	2	1	2	8	2
1	2	5	8		1	6	8	8	0	9	4	3	7	9
7	3	4	6			1	3	4	6		7	1	6	9

Pg 42. Number crossword

	1	3			1	4	6		
1	2	1	5		5	6	2	3	
1	5		9	5	6	7		1	3
	3	1		9	6		6	0	8
		5	9			9	4	2	0
2	4	2	6			7	8		
9	9	0		5	4		1	6	
6	7		6	6	9	5		3	4
	2	5	2	4		1	6	2	5
		5	0	2			1	1	

Pg 43. Number crossword

		9	8	1		7	6	9	5
	4	0	6	7		3	1	2	8
2	7			8	2	7	7	9	
4	5		9	9	1	9		5	4
		3	1	5			9	8	6
7	2	0			4	8	4		
3	9		2	6	9	5		8	1
	1	2	1	1	3			5	7
1	4	6	1		9	8	1	3	
6	0	4	6		5	8	4		

Pg 44. Addition crossword

26	+	25	=	51		55	+	72	=	127
				+						
15	+	32	=	47		66	+	47	=	113
				=						
23	+	98	=	121						

22	+	78	=	100		24	+	65	=	89
+				+		+				
35		45	+	47	=	92				
=				=		=				
57				147		116	+	24	=	140

Pg 45. Subtracting decimals crossword

[illegible]

Pg 46. Decimals addition crossword



$$7 \times 8 =$$

