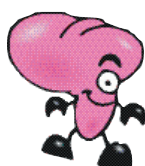


ISBN-10: 1-874428-54-9

ISBN-13: 978-1-874428-54-1



Big Edd

Y7 Big Edd Sample Resources

from the

Y7 Teachers' Resource and Assessment Pack

The topic **“Shape”** can be downloaded
from the website www.mathsisjugglers.com

**You have permission to print
this topic for use with your students.**

This pack contains the **Teachers' Resources and Assessments**

for the topic “Shape” in the Big Edd Guide.

You have permission to print these for use with your students.

CONTENTS OF THE PACK

Contents and information about the course/material	p2-5
Teachers' Notes	p6-8
Star Challenge Answers	p9-12
High Level Challenge Answers	p13-14
Worksheets	p15-16
Specialist papers	p17-21
Revision Sheet (<i>The student can check this using the answers on the back.</i>)	p22-23
Assessment (<i>with spaces for answers on the sheet</i>)	p24-25
Assessment Answers and Mark Schemes (<i>Answers are given on a copy of the test itself – this makes marking much quicker</i>)	p26-27
Can-Do Sheet (<i>optional, but it can be a useful two way communication between school and parents</i>)	p28

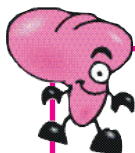
SUGGESTED Y7 FRAMEWORK MODIFICATIONS FOR BIG EDD p29-48

The Y7 Big Edd Guide, the Y8 Fission Guide and the Y9 Optimistic Guide stretch the more able students way beyond what is required by the Framework.

Almost everything that is required in the Frameworks for Y7, Y8 and Y9 is delivered in these texts, but not always in the same year as in the Framework.

This booklet:

- suggests parts of the Big Edd text that should be omitted for more able students
- provides a list of some items that need to be done as mental starters (linked to relevant topics, where applicable)
- provides COPYMASTER worksheets that can be used to fill in the (few) gaps



CONTENTS OF THE BIG EDD GUIDE

Topic Title	Main Sections	High Level Challenges
Sum Number Fun	pp05 – 30	pp31 – 38
Introducing Area	pp39 – 63	pp64 – 74
Journeys, Maps and Coordinates	pp75 – 93	pp94 – 98
Shape SAMPLE TOPIC	pp99 – 113	pp114 – 120
Fractions and Decimals	pp121 – 152	pp153 – 160
Handling Data	pp161 – 176	pp177 – 184
Angle	pp185 – 211	pp212 – 224
Number Patterns	pp225 – 244	pp245 – 248
Nets, Cubes and Volumes	pp249 – 269	pp270 – 274
ANSWERS	pp275 – 304	

All the topics are independent.
They can be done in any order.

THE BIG EDD GUIDE

At the end of each topic is a section of
HIGH LEVEL CHALLENGES.

Able students are expected to tackle these Challenges
when they have finished a section
(rather than moving onto the next section).

They can also do them in their own time.

Some of these challenges have section labels.
These indicate which section should have been completed
before that challenge should be attempted.

At the end of the book is a section of
MISCELLANEOUS HIGH LEVEL CHALLENGES.

These are not linked to any topics in the book
and can be done at any times and in any order.
They range from short problems to fairly lengthy problems,
to linked sets of problems.

The **High Level Challenges** were first used in the highly successful *Big Edd Guide*.

At Tarporley High School, students in our two top sets loved them. Almost all top set students did every High Level Challenge. Many completed all 152 of them before the end of the year, and came back and asked for more. (So there are now 200 in *Headbanger*.)

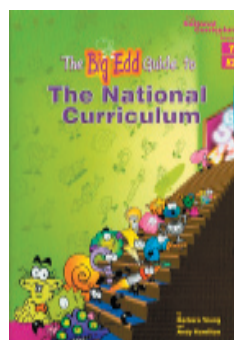
But, unexpectedly, many of the students in our two second sets tackled a lot of these problems with great enthusiasm. These students had successes with puzzles and problems that we had thought well beyond them. Confidence and motivation soared and, later, so did exam results.

Other schools using this material report similar reactions.

There are two versions of our Y7 National Curriculum Mathematics Course.

The mainstream course (*The Big Edd Guide*) is suitable for the upper 60% of students.

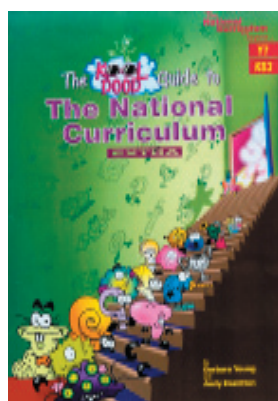
For able students, the *Big Edd Guide* contains **High Level Challenges** which are linked to the topics being studied and the **Miscellaneous High Level Challenges** which are independent of the topics being studied.



A5 text

ISBN-10: 1-874428-54-9

ISBN-13: 978-1-874428-54-1



A4 text

ISBN-10: 1-874428-72-7

ISBN-13: 978-1-874428-72-5

The **EXTRA** course (*The Kooldood Guide*) is suitable for the lower 60% of students.

For low attainers, the *Kooldood Guide* develops one idea at a time, before combining several ideas that have just been learnt. It also contains **EXTRA** rote practice exercises.

Order a **half price** copy of Y7 Big Edd and/or Y7 Kooldood
using the Special Offer form
which can be downloaded
from the website
www.mathsisjugglers.co.uk

The KOOLDOOD Guide **EXTRA**

An unusual approach to Mathematics for Low Attainers – that works !!

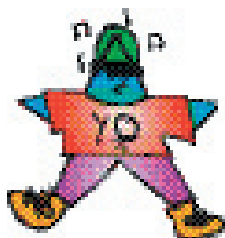
Students in our lower sets said

“We don’t want a course that only does the easy stuff (a ‘dumbo’ course).

We want to do the same work as everyone else.

- So, will you please:
- make the instructions and explanations clearer
 - introduce ideas more slowly and put in extra steps
 - put in extra practice
 - make the work interesting”

SO WE DID !



Our EXTRA texts for LOW ATTAINERS do not follow the route of so many other texts for these students.

Instead of giving them lots of easy material, we took the syllabus and delivered it in such a way that LOW ATTAINERS could understand and cope with the ideas and techniques.

We gave them what they had asked for !!

But we couldn’t have produced these texts had it not been for the active help of the students themselves. We started with the mainstream texts and students really enjoyed finding out what didn’t work for them - but, more importantly, WHY!! They quickly became expert at pinpointing where the material didn’t work for them and helping to find what would work for them.

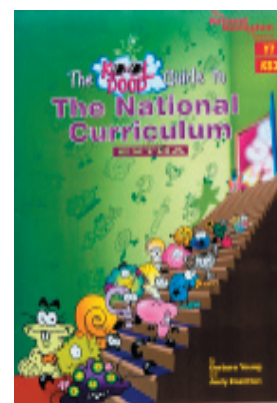
Devising ways that would work took a lot of working/trialling with LOW ATTAINERS, but we ended up with the EXTRA texts – which work exceptionally well, particularly with bottom sets, disaffected students and students at Pupil Referral Units.

This **EXTRA** course :

- has been specially developed for low attainers
- is a version of the Y7 mainstream course
- has lots of EXTRA practice on all techniques
- can be run alongside the mainstream course
- can stand on its own
- is suitable for the lower 50% of the ability range

Each student:

- takes responsibility for his/her own learning
- can decide how much practice (s)he needs to do for each technique
- can try Star Challenges when (s)he feels ready for them
- will be capable of taking the mainstream tests



ISBN-10: 1-874428-72-7

ISBN-13: 978-1-874428-72-5

The authors firmly believe that all students can tackle the material in the mainstream course. However, some students need :

- more time to get to grips with the ideas and techniques involved
- lots of EXTRA practice
- one idea at a time introduced step-by-step
- to meet ideas and techniques over and over again

Most students in lower sets are underachieving.
This course aims to raise the level of achievement of these students.
Students can transfer to or from the mainstream course.

How does the Star Challenge system work ?

The number of stars is a measure of the difficulty of the Challenge.

So, one star denotes a basic fairly easy challenge.

However, students should not be discouraged from attempting any Challenges.

For example, students may earn fewer stars from many two or three star challenges, with partially correct answers.

Students of lower ability can amaze you with what they can achieve, if they really want to tackle problems that you might think beyond them.

A true cautionary tale

Three very low ability students were working together. They had to. Mark was severely dyslexic - he could not read at all. Jason could read very well, but could make no sense of what he was reading. Matthew was very slow at everything. Between them, they could tackle problems.

Jason would read the question. Mark would explain what it was all about. Together the three of them would work out how to solve the problem.

One day they had done all the one star problems. They asked me if they could try the three star problem - The Chest of Drawers. It contained a mixture of fractions and decimals and both cm and mm. My first reaction was to tell them that it was too difficult for them - but I said they could try it, provided they accepted that they might not be able to do it.

About ten minutes later, they brought me the correct answer. I couldn't believe that they had solved such a complex problem. I changed the data (marked below in blue). They were back a few minutes later with the correct answer. Then I made a big mistake. I asked them to tell me how they had worked it out. I couldn't follow their explanation at all !!

From then on I never restricted the choice of Star Challenges of even the least able students.

Star Challenge

The chest of drawers

A chest of drawers 84 cm high has a 42.5 mm top and a 90 mm base. Four identical drawers fit in between, with 22.5 mm between each drawer.

Work out the height of each drawer in cm.

If the 22.5 mm gaps were reduced to 12.5 mm each, what would be the height of each drawer then?

The diagram shows a chest of drawers with a total height of 84 cm. It has a top panel of $4\frac{1}{4}$ cm and a base of 9 cm. There are four drawers in between. The gap between the top panel and the first drawer is $2\frac{1}{4}$ cm. The gap between the last drawer and the base is $2\frac{1}{4}$ cm. A double-headed arrow with a question mark indicates the height of one of the drawers.

What do schools do with the stars students earn for Star Challenges ?

One school:

- gives a house point for each star.
- has a commendation system and awards a commendation for so many stars. They also award stars for effort when the books are taken in each fortnight.
- gives a smiley face for 5 stars
- gives a Mars Bar for 10 stars
- gives a copy of one of a group of Chaos posters for 20 stars (very popular with low attainers)
-

It doesn't matter what you do. It is the sense of achievement that is most important.

However, a system that awards something for so many stars, then starts them collecting the next set of stars, means that students keep track of how many stars they have and how many more they need towards the next 'prize' – instead of (possibly invidious) comparisons of the total number of stars each student has.

Shape Teachers' Guide

Printing list

Star Challenge 10 : Diagonals
 Star Challenge 13 : Lost shapes
 3 x 3 spotty paper
 4 x 4 spotty paper
 triangular spotty paper
 Sheet of hexagons

Big Edd Kooldood Pack Page

p 106 p 82 p 87
 p 109-110 p85-86 p98
 p100,106 p76,82 last section
 p107 p83 last section
 p102,108,113,115 last section
 p117 — last section

Also squared paper if students are not working in squared books

Setting the right pace

You will obviously want to let any who are much better than the rest of the group get ahead. If they are enthusiastic, and getting right answers, then you don't want to curb their enthusiasm. But, it is a good idea to periodically bring the bulk of the class up to the same point, so that class instruction can be given. We insisted that any student who finished the current section before the rest of the class must go onto the High Level Challenges for that section. If they finish the relevant High Level Challenges then they may go back and tackle any outstanding High Level Challenges from earlier sections.

Homework

Possibility 1: At the end of the lesson, get each student to mark where they have got to (eg 'Homework starts here') and then they continue from that point for at least... minutes.

Possibility 2: Decide in advance which piece(s) you are going to set for homework(s) from the current section and tell students that they are not to be done in class.

If you have a class that is mixed ability, or a very wide ability range, then one suggestion is to set two pieces of work – one that is accessible to all and compulsory, and one that is offered as a Challenge (one of the Star Challenges maybe).

Note on 3 x 3 and 4 x 4 geoboards

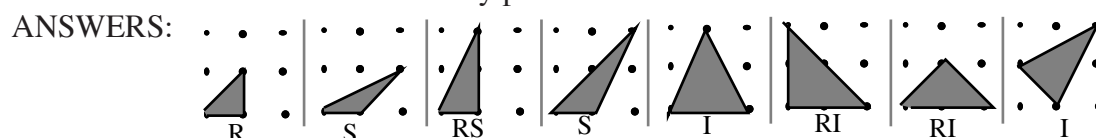
We asked our Technology Dept for help with these items and they got some Y7 pupils to make them using hardboard and dowelling.

Section 1: Triangles

D1: Congruent triangles Before a student is asked to find *different* shapes, (s)he needs to be able to recognise what we mean by the *same* (congruent) shapes. Answers have not been included for D1 in the students' text as there are so many possibilities. IT IS ESSENTIAL that each student gets D1 checked by the teacher before they go onto D2.

D2: Classifying triangles

All Individual work It is important that students check with the teacher that the 8 triangles they have found are all different, before they go on to classify them. Answers have not been included for D2 in the students' text as there are so many possibilities.



Students need to do **P1: Matchstick triangles** before they can do Star Challenge 1.

Star Challenge 2 makes an excellent homework and is much easier to mark if you insist that they rewrite each answer (if necessary) in alphabetical order.

For *Kooldood* students, Star Challenge 3 has been replaced by Star Challenge 3F, which has more accessible instructions.

Section 2: Rectangles and squares

Here we look at the properties of rectangles and squares and try put over the point, which will be needed in a lot of later geometry, that a square is a rectangle.

D1: Truths, untruths and halftruths

Small group work followed by whole class session.

If this is just done as class discussion, then some pupils will leave it all to others and many of the ideas will go over their heads. Small group discussion makes it more likely that all pupils will make some contribution. They also get great satisfaction when their group's view is proved right.

Besides going over the properties of rectangles and squares, this piece introduces the idea of something being right part of the time. The most important idea here is that a **square is a rectangle**.

ANSWERS : A, B, C : true and sometimes true
D : both true
E : true and untrue

D2: Finding the exact centre of a rectangle

Whole class session.

Many people measure half way along each side and then draw lines across the rectangle. Easiest (and most accurate way) is to draw the diagonals. This technique will be needed in craft/technology lessons.

D3: How many different rectangles can you find ?

Individual work

This reinforces the ideas met in Section 1 and cannot be done until the student has accepted the fact that a square is a rectangle.

Kooldood has different Star Challenges to *Big Edd* for *Ch7 and *Ch8

Section 3: Quadrilaterals

All Individual work *Here students meet and become familiar with a variety of quadrilaterals using the skills developed in Section 1.*

Although *Ch 11 has 4 stars, it is accessible to students of all abilities, even though all students will not be able to complete it.

Section 4: More polygons

All Individual work *Here we introduce other polygons and meet the idea of a regular polygon.*

D2: Make a regular hexagon

Cutting out and physically putting together 6 equilateral triangles to make a hexagon, makes the idea "stick" (sorry!) much better than just drawing the triangles.

D3: Compass constructions

It is quite deliberate that no instructions have been given. Many pupils will know how to do it or can work it out. Those who do not know will need individual help, from other pupils or the teacher. Try to give the minimum help necessary. [Look for construction arcs - they must be on the diagram]

Star Challenge 13: Lost shapes

This is much more difficult than it would first seem - and children are much better at it than adults ! - it makes an excellent homework.

Section 5: Circles

All Individual work *Here students get used to or review circle terminology in a practical way. The connection between radius and diameter is stressed. Students get the chance to develop some expertise with a pair of compasses.*

More able students using *Big Edd* should be encouraged to follow this work with the Magic Egg tangram (High Level Challenge 11)

Section 6: Tessellations

All This is a simple introduction to tessellations.

Individual Students get the chance to put together some of the shapes met earlier in the unit.

work Teachers will need to check each student's tessellations individually – sorry !

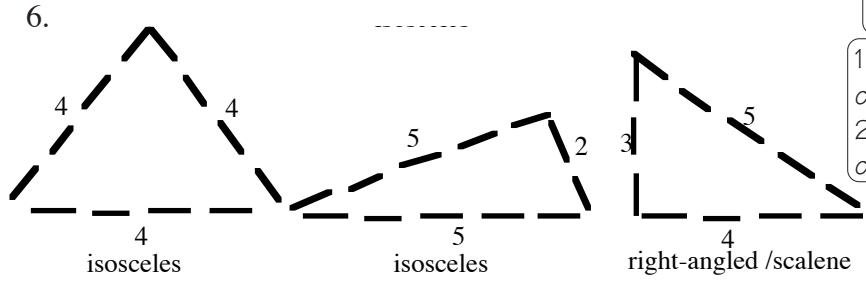
Excellent section for producing displays !

For *Kooldood* students , this section has been extended.

Shape

Star Challenge Answers

1-1



11 marks = 2 stars
9-10 marks = 1 star

1 mark for each correct triangle,
2 marks for each correct classification

7. For an equilateral triangle, the number of matches must be a multiple of 3. (2 marks)

2-2

23 triangles = 2 stars
15-22 triangles = 1 star

The 23 that Mio found are :
ABE, ABF, ABH, ACE, ACG, ADE, ADF, ADG, AEF, AEG, AEH, AFG, AFH, BCE,
BDE, BDF, CDE, CDG, DEF, DEG, EFG, EGH, FGH

3-3

5 marks = 2 stars
4 marks = 1 star

Both correct = 1 star

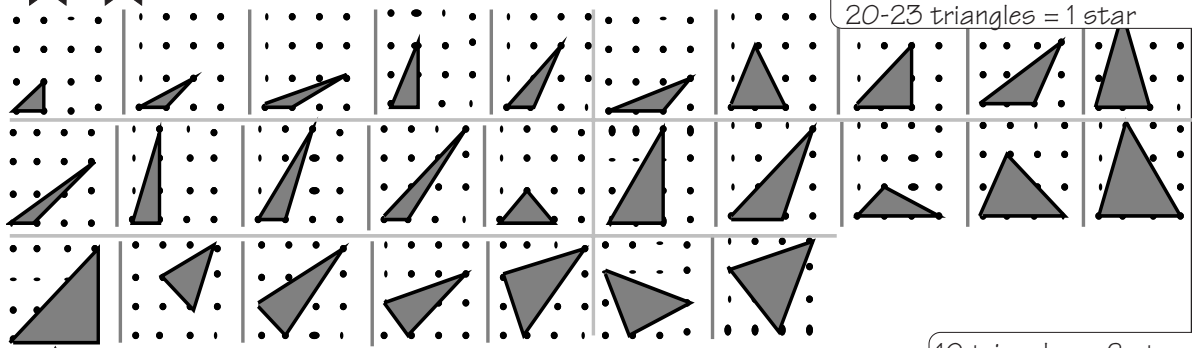
Task 1: 13 & 27 (2 marks)
Task 2: (2 marks)
Task 3: The 6 matches make a tetrahedral framework – a triangular pyramid (1 mark)

3F

Kooldood only:
13 and 27

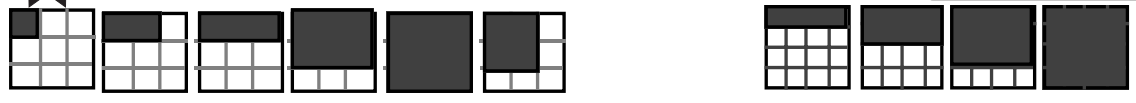
4-4-4

27 (or more) triangles = 3 stars
24-26 triangles = 2 stars
20-23 triangles = 1 star



5-5

10 triangles = 2 stars
8-9 triangles = 1 star



6

All correct = 1 star

2. 55 [=25 + 16 + 9 + 4 + 1] 3. 385

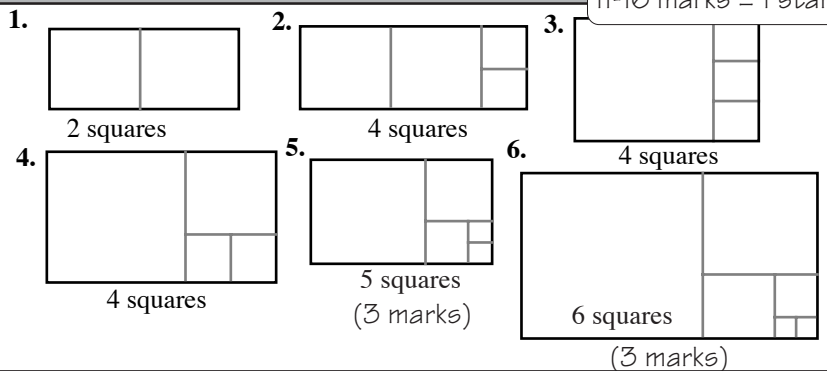
7-7

17 marks = 2 stars
11-16 marks = 1 star

Task 1: 13 (3 marks)

Task 2:

Task 2: Q1 - 4, for each question, 2 marks – 1 for each number and 1 for the diagram



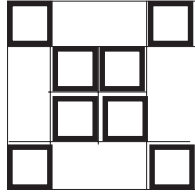
Shape

Star Challenge Answers

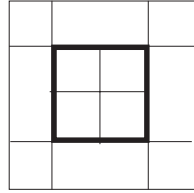
7F

13 squares

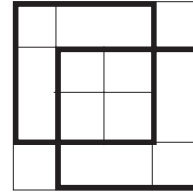
Kooldood students have been asked to draw diagrams to show the squares.



8 small squares



1 2 x 2 square

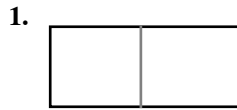


4 3 x 3 squares

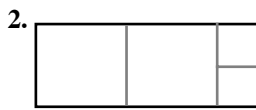
Any correct diagrams and total = 1 star

8F 8F

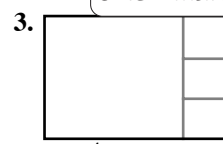
Kooldood students only



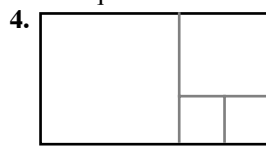
2 squares



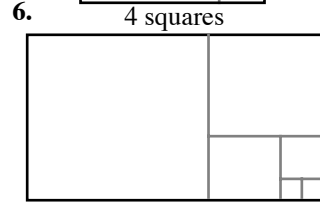
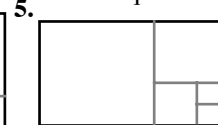
4 squares



4 squares

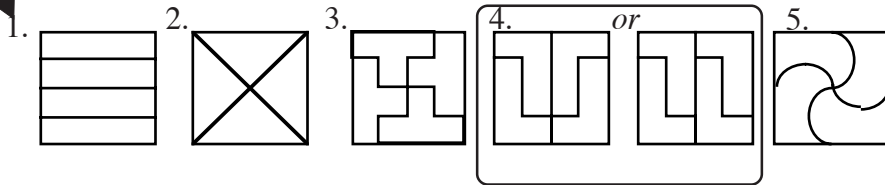


4 squares



14 marks = 2 stars
9-13 marks = 1 star

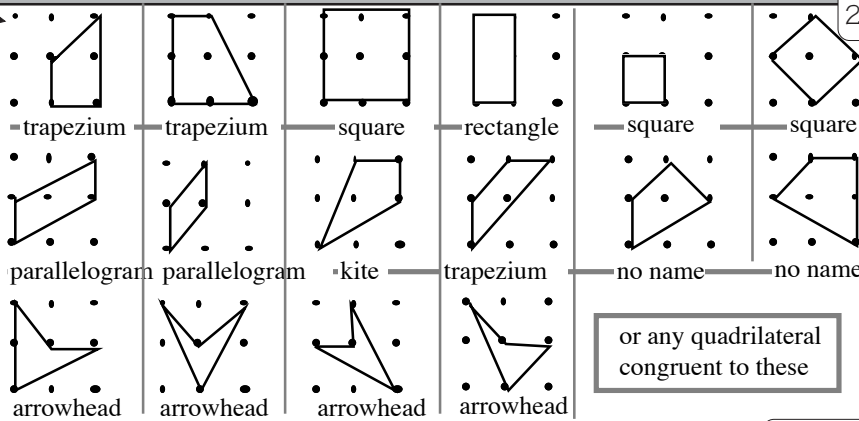
8 8



12-13 marks = 2 stars
6-10 marks = 1 star

(1, 2, 3, 3, 4 marks)

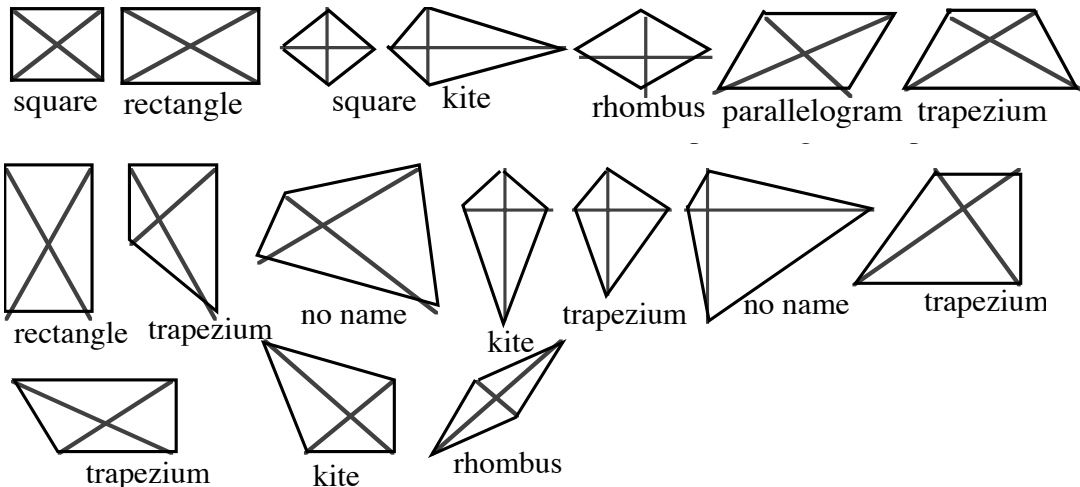
9 9



30-32 marks = 2 stars
22-29 marks = 1 star

1 mark for each different quadrilateral,
1 mark for each correct name

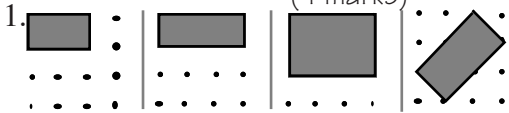
10

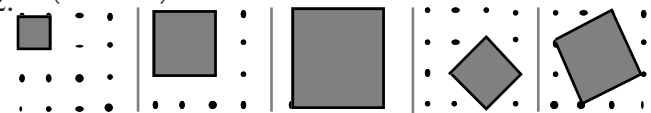


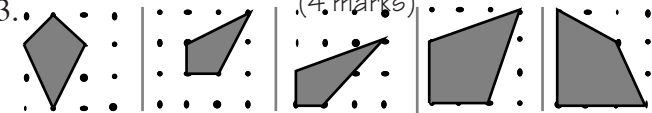
14-16 correct names = 1 star

38 marks = 4 stars
 34-37 marks = 3 stars
 30-33 marks = 2 stars
 28-29 marks = 1 star

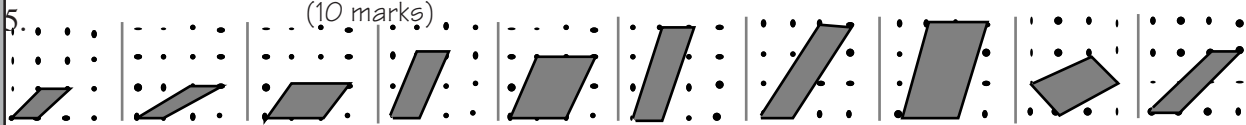
11 **11** **11** **11**

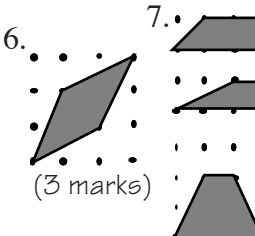
1. (4 marks) 

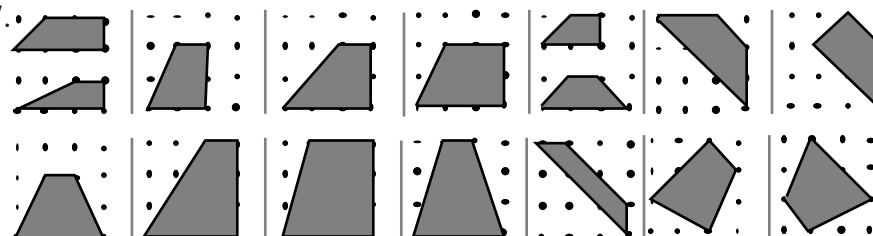
2. (5 marks) 

3. (4 marks) 

4. There are at least 12 of these so students should have no difficulty finding 5. (5 marks)

5. (10 marks) 

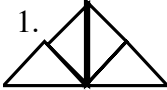
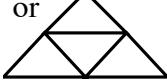
6. (3 marks) 

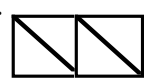
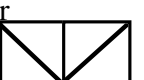
7. 

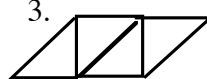
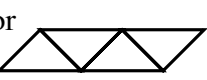
8 = 4 marks
 10 = 5 marks
 12 = 6 marks
 14 = 7 marks

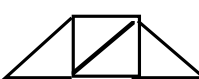
12

All correct = 1 star

1. 
 or 

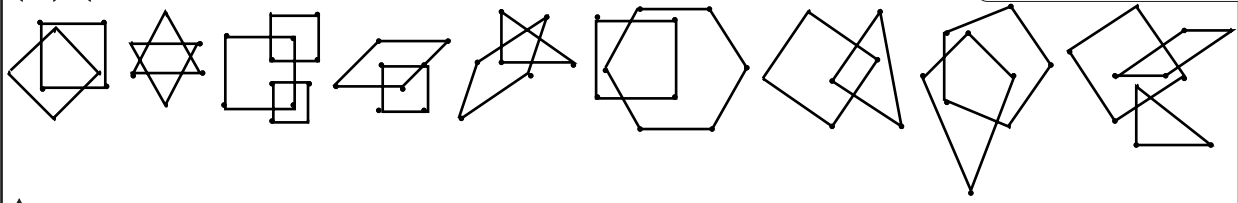
2. 
 or 

3. 
 or 

4. 

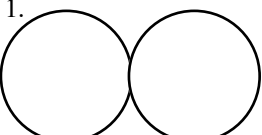
13 **13**

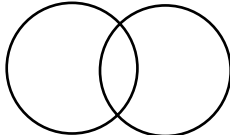
19-20 marks = 2 stars
 15-18 marks = 1 star

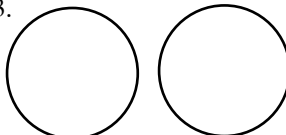


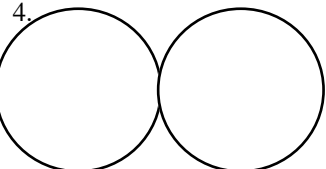
14

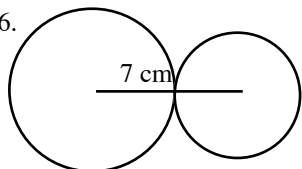
5-6 correct = 1 star

1. 

2. 

3. 

4. 

6. 

7. 35 cm

15

2-3 correct Tasks = 1 star

Task 1: Tessellation of at least 6 of student's own triangle. All triangles tessellate.

Task 2: Tessellation of at least 8 equilateral triangles cut from triangular spotty or triangular lined paper.

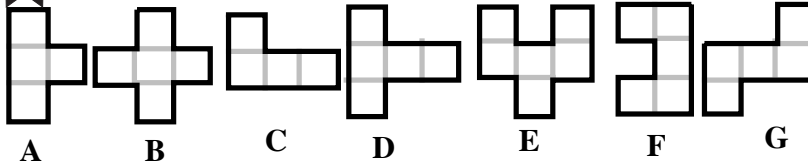
Task 3: Tessellation of at least 8 hexagons cut from triangular spotty or triangular lined paper.

16

16

16

8-10 marks = 2 stars
5-7 marks = 1 star
plus 1 star for a good display



Task 1: Make a tessellation with shape A. Use at least 12 copies of the shape. Colour the tessellation to show the pattern clearly. (2 marks)

Task 2: It is possible to make tessellations with four of the other shapes. Experiment with each of these shapes. For each shape that will tessellate, make a tessellation. *B C E G tessellate* Use at least 12 copies of the shape. Colour the tessellations to show the patterns clearly. (2 marks for each correct tessellation)

Task 3: Make a display of your tessellations that is good enough to go on the classroom wall.

Ch1: Going round in circles

7-8 correct = 2 stars
6 correct = 1 star

1. 3	2. 7	3.	number of dots	6	7	9	10	12
			number of triangles	4	5	7	8	10

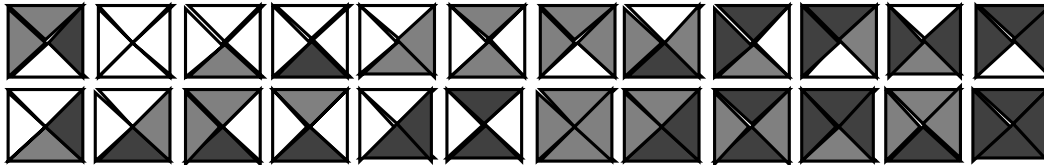
4. number of triangles = 2 less than the number of dots

5. $n - 2$ 6. 15 7. 80 8. $n \times (n - 2)$

Ch 2: MacMahon Tile Puzzles

1 star for a solution to Puzzle No. 1
plus
2 stars for a solution to Puzzle No. 2

Puzzle Number 1



Puzzle Number 2 There are more than 1000 solutions to this.

Ch 3: Investigating 3-dot triangles

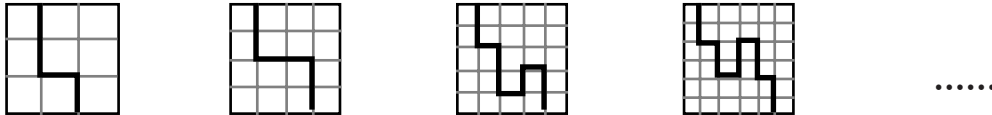
4 correct = 2 stars
3 correct = 1 star

1. C & F Q2, 3 & 4 The number of 3-dot triangles stays the same. 5. only 2 ways

Ch 4: Mega-challenging problem

1 star for a solutions to Q1 & 2
plus 2 stars for a solutions
to each of Q3-5

This is a very time-consuming problem (taking lessons, rather than minutes and patience as well as ability). It is only for the very able student.



Ch 5: The ultimate polygon challenge

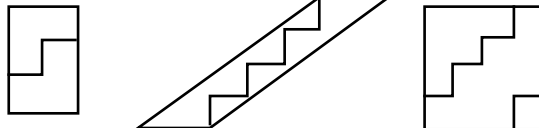
All correct = 2 stars



A 16-side polygon

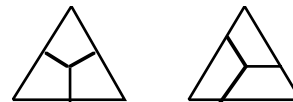
Ch 6: I bet you can't ...

All correct = 1 star



Ch 7: Dissections of an equilateral triangle

All correct = 1 star



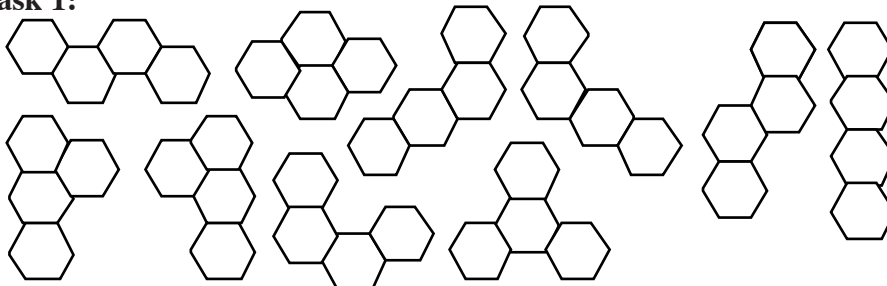
Ch 8: Crossed hexagons

16 hexagons = 3 stars
14-15 hexagons = 2 stars
12-13 hexagons = 1 star

Check that each dot is visited once only.
Reflections are allowed provided they are not rotations.

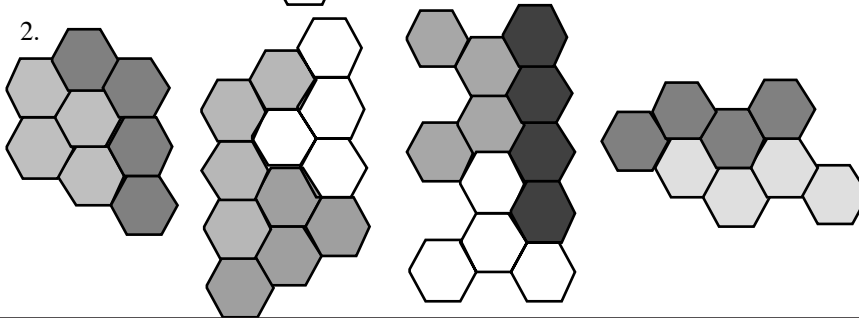
Ch 9: Tetrahexes

Task 1:

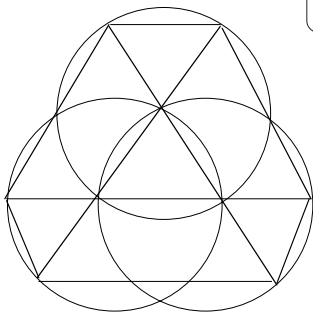


Task 1: 10 correct = 1 star
Task 2: 2 correct = 1 star
4 correct = 2 stars

Task 2:



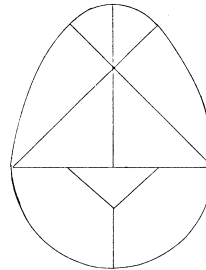
Ch 10: Compass Capers



All correct = 1 star

- 6. A hexagon
- 7. 7

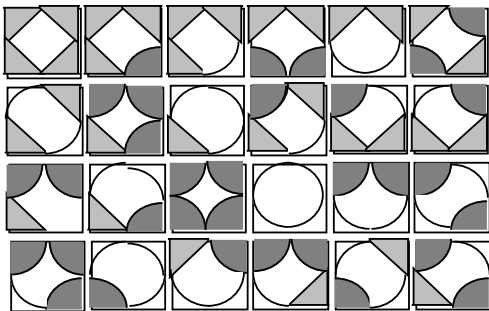
Ch 11: The Magic Egg tangram



1 star for correct egg
1 star for bird from tangram pieces

Ch 12: A famous combinatorial problem

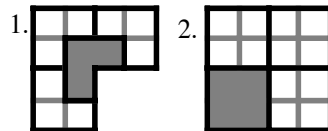
Task 1:



Task 2 & 3: There are many possible solutions to these tasks.

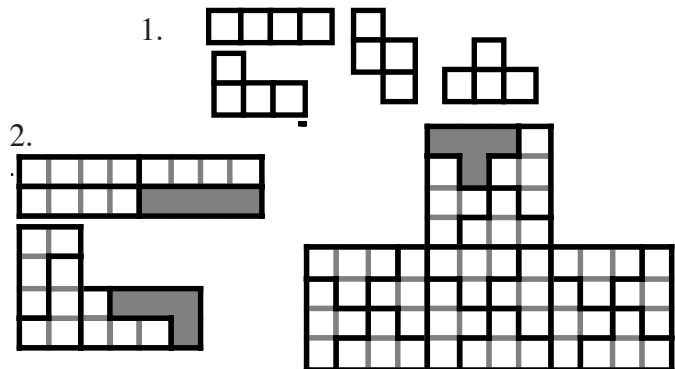
Ch 13: Repli-tiles

All correct = 1 star



1 star for each correct repli-tile

Ch 14: The ultimate repli-tile challenge



We have not managed, so far, to find a repli-tile for the last tetromino. Can your students find it?

Star Challenge 10

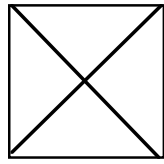
14-16 correct names = 1 star

Diagonals

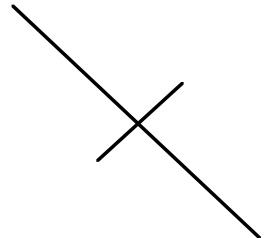
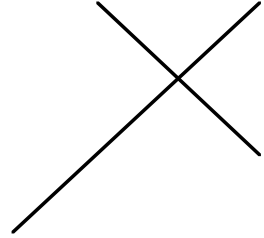
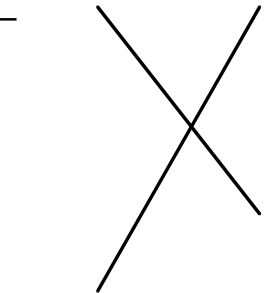
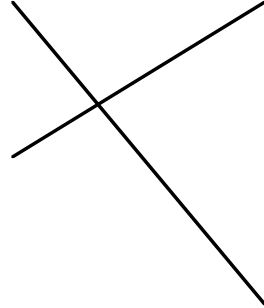
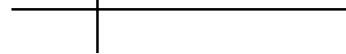
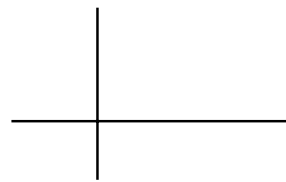
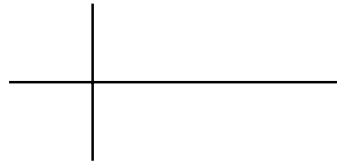
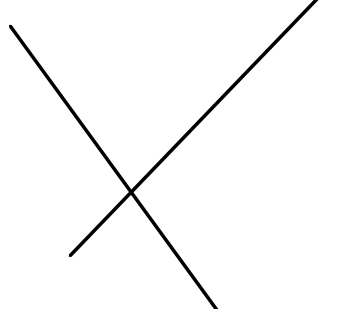
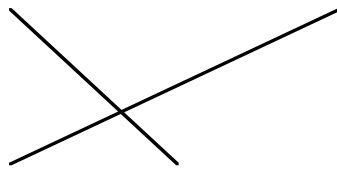
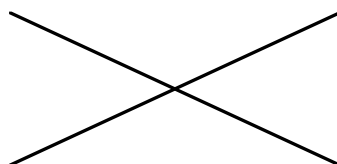
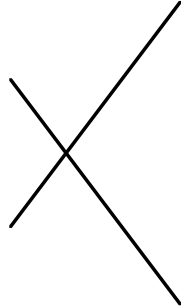
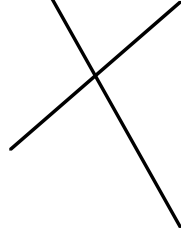
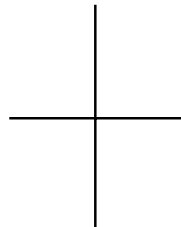
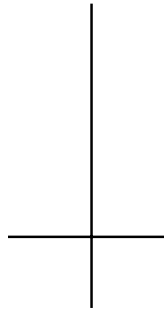
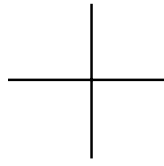
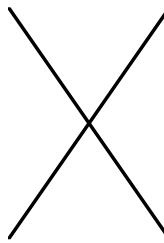
These are all diagonals of quadrilaterals.

Draw the quadrilaterals. The first one has been done for you.

Name the quadrilaterals. There are two that have no name.

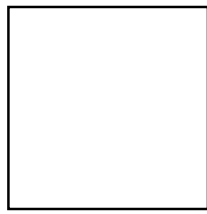


square



Lost Shapes : page 1

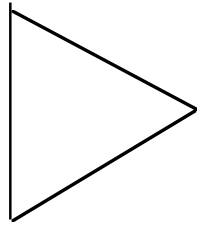
1. These dots are the corners of two squares of this size.



Find them.

(2 marks)

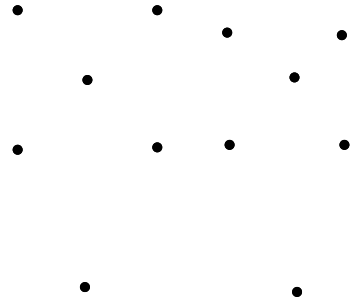
2. These dots are the corners of two equilateral triangles of this size.



Find them.

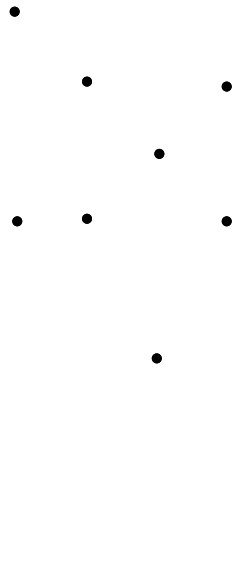
(2 marks)

3. These are the corners of three squares of different sizes. Find them.



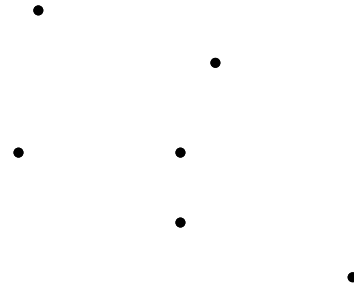
(3 marks)

4. Find a square and a parallelogram.



(2 marks)

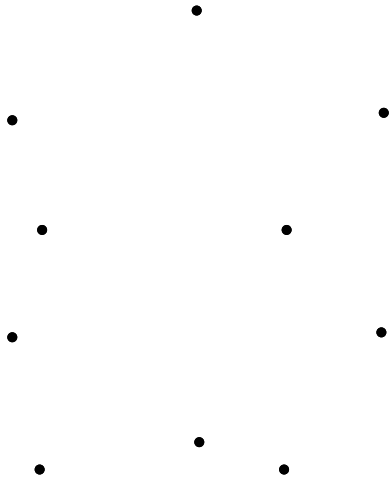
5. Find a parallelogram and a right angled triangle.



(2 marks)

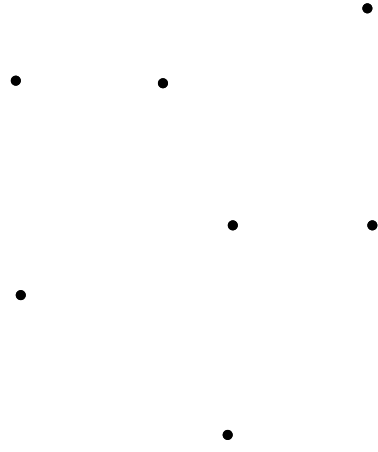
Lost Shapes : page 2

6. Find a regular hexagon and a square.



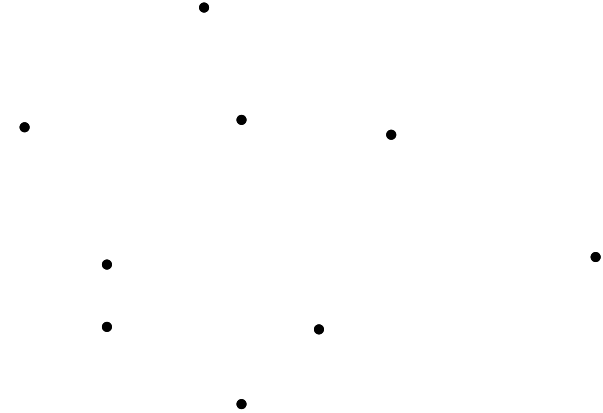
(2 marks)

7. Find a right angled isosceles triangle and a square.



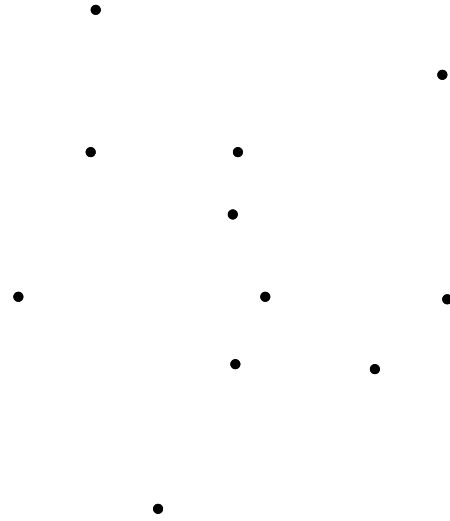
(2 marks)

8. Find a regular pentagon and a kite.



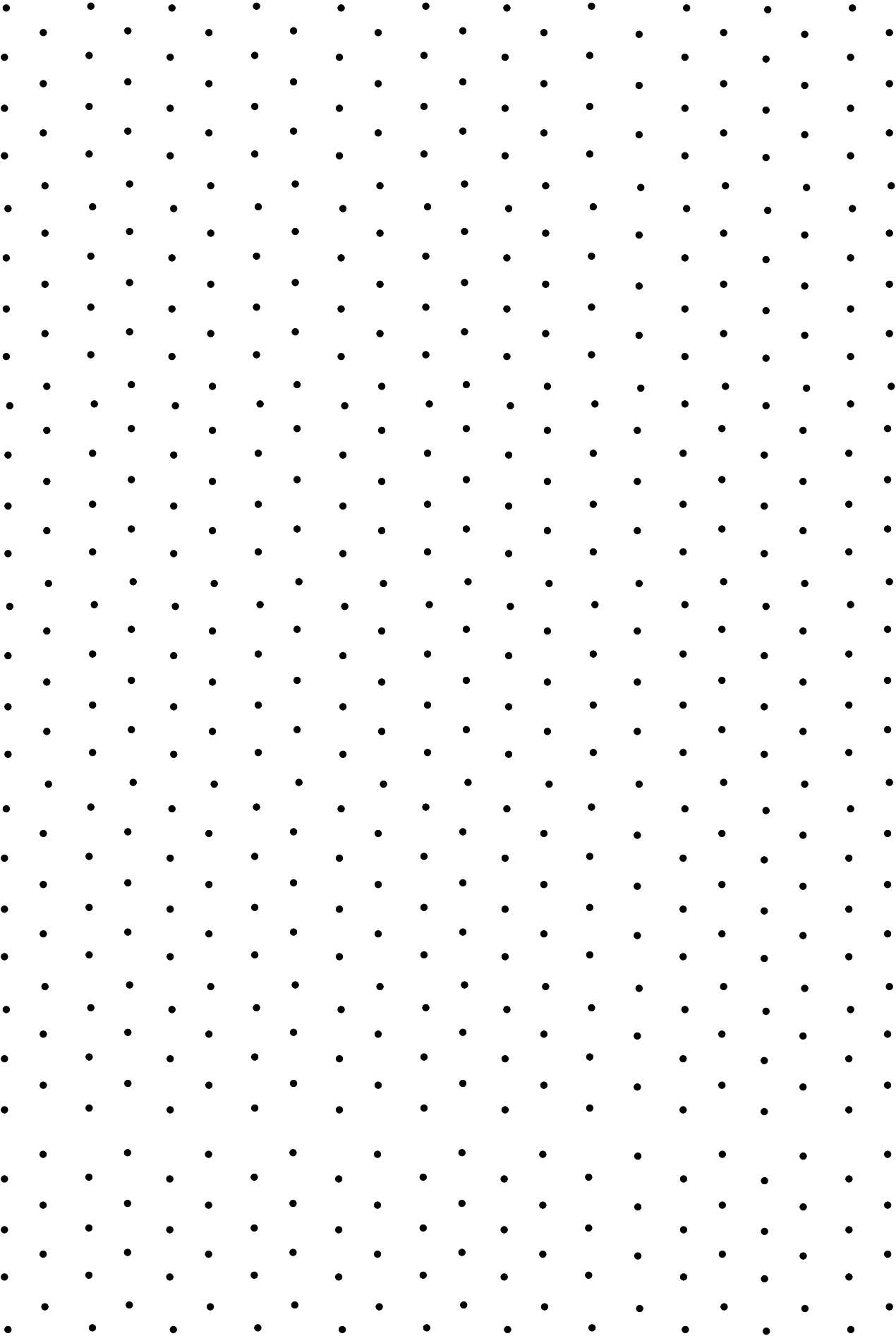
(2 marks)

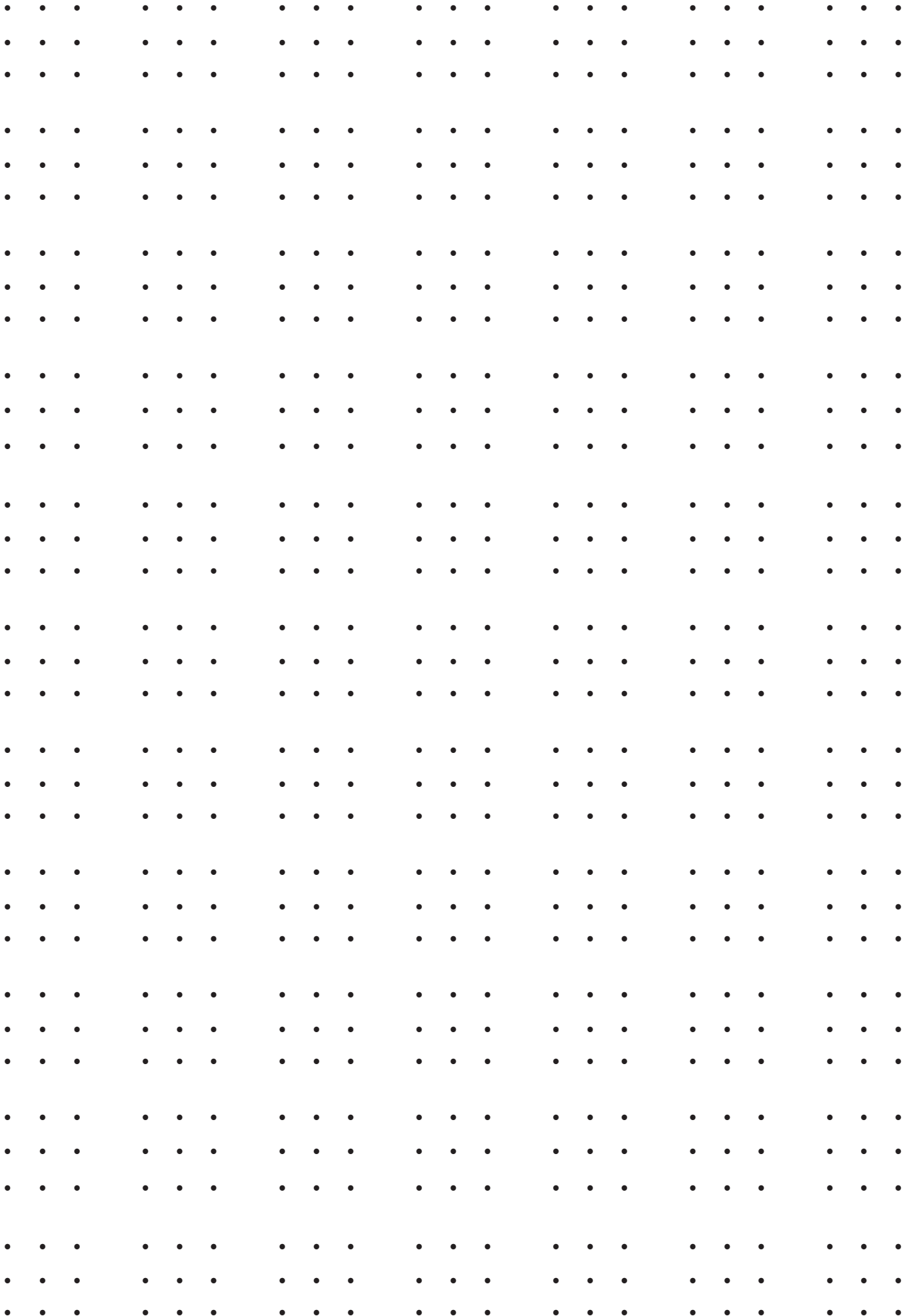
9. Can you find a parallelogram, a square and a right angled triangle?

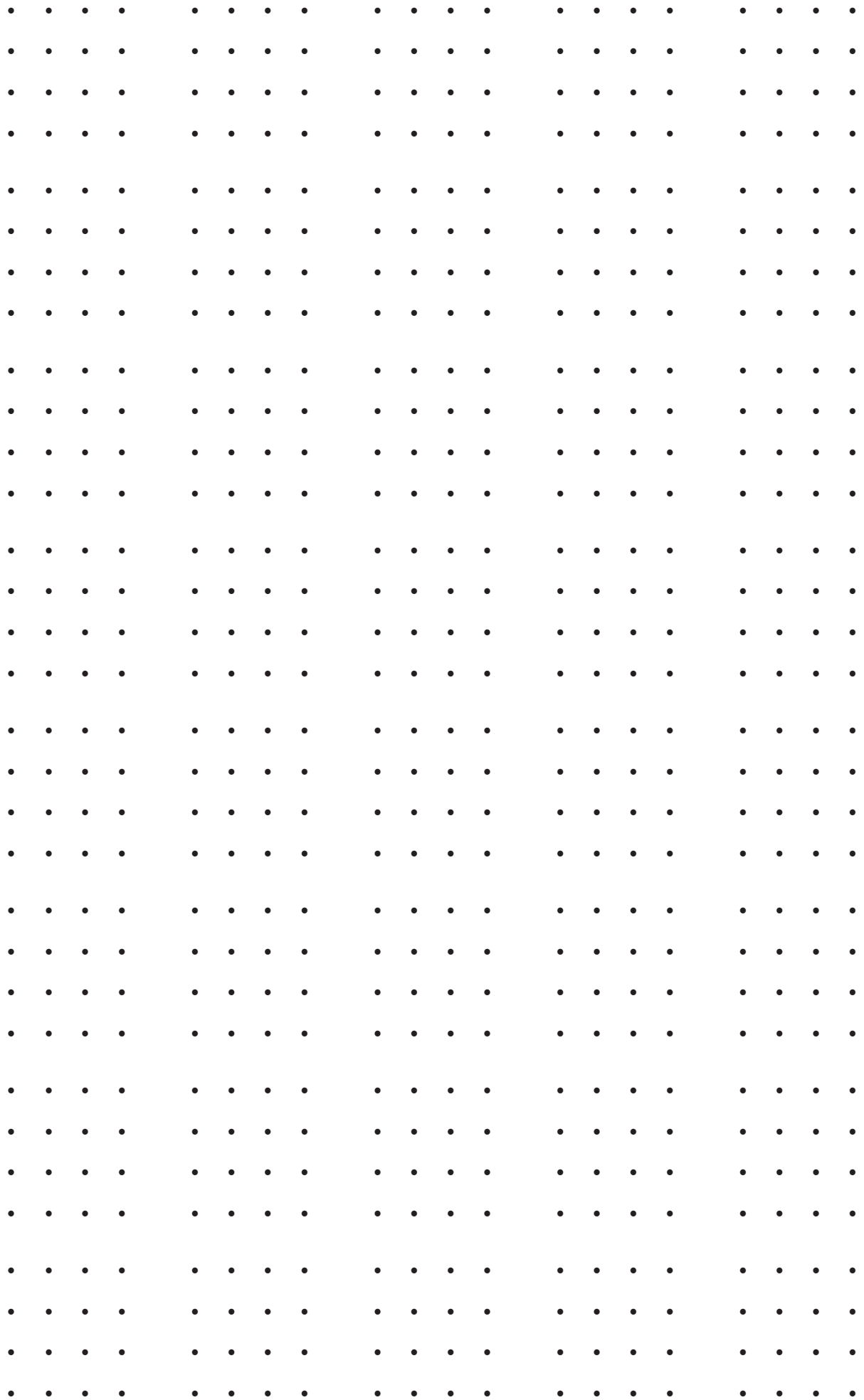


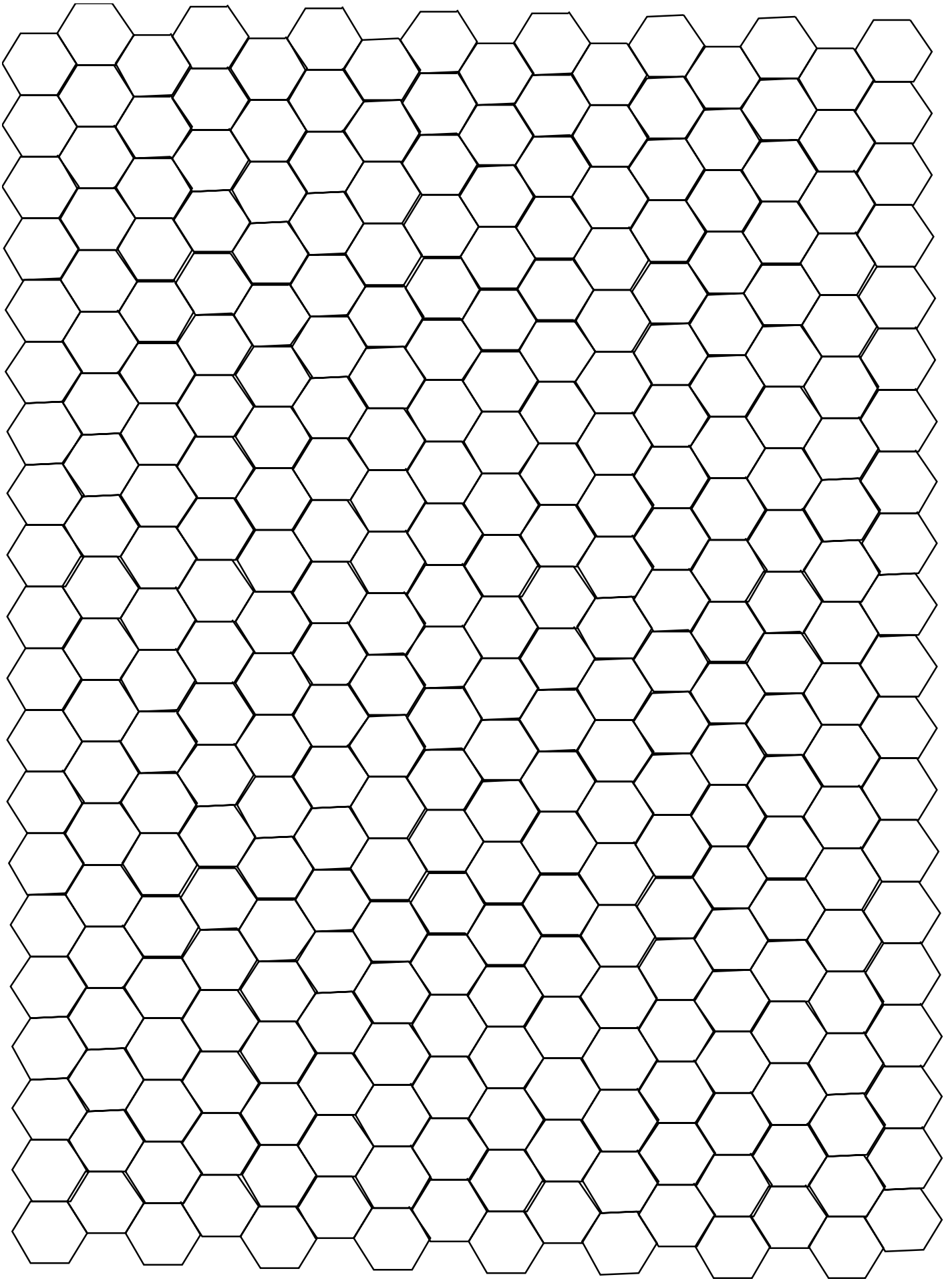
(3 marks)

Isometric spotty paper









Shape

Name :

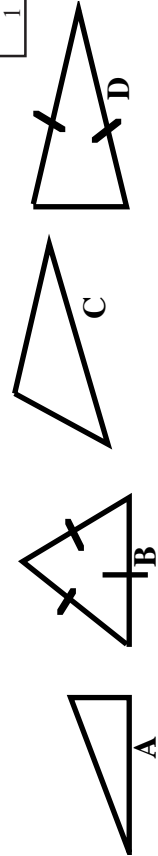
Revision

Attempt all questions.

WRITE THE ANSWERS ON THIS SHEET.

LEVEL 3

Section 1



1.

Match each of these triangles with their labels.
Write the correct letter alongside each name.

- Equilateral triangle
- Isosceles triangle
- Scalene triangle
- Right-angled triangle

LEVEL 4

Section 5

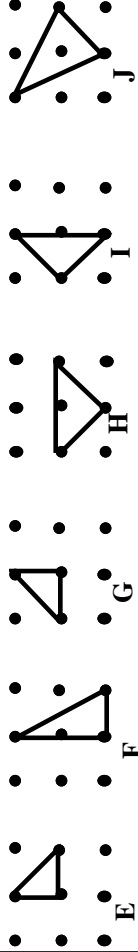
2. Draw a circle of radius 3 cm.
What is the length of the diameter of the circle ?
.....

Draw a circle of radius 2 cm which is concentric with the first circle.

Section 41

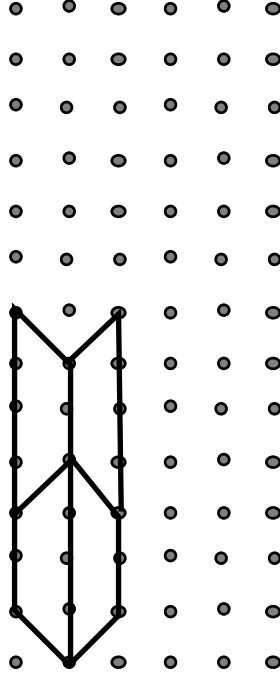
LEVEL 4

3. Draw lines to join any triangles which are congruent.



Section 6

4. Extend this tessellation across and down the page by drawing at least 8 more tiles.



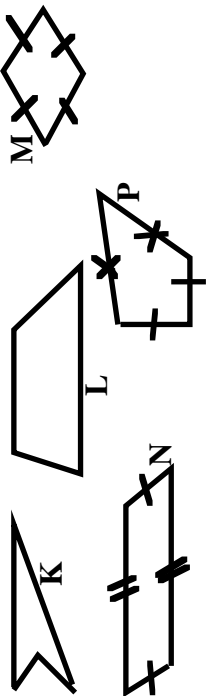
Section 4

LEVEL 5

5. Construct an equilateral triangle with sides 4 cm long.

Section 3

LEVEL 6

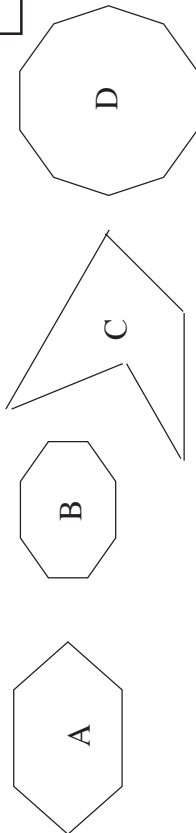


Match each of these quadrilaterals with their labels.
Write the correct letter alongside each name.

- Parallelogram
- Rhombus
- Trapezium
- Kite
- Arrowhead

6.

Section 4



Match each of these POLYGONS with their labels.
Write the correct letter alongside each name.

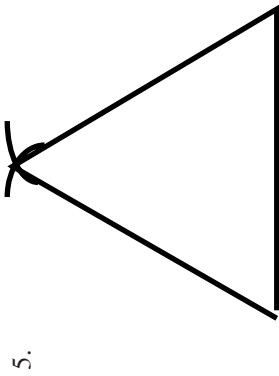
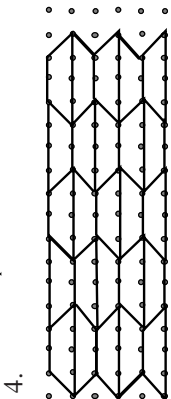
- Octagon
- Decagon
- Pentagon
- Hexagon

7.

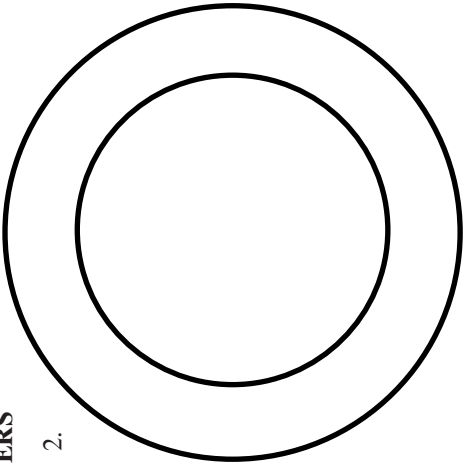
Shape

STUDENT ANSWERS

1. B 2. D 3. C 4. A



- 6. N 7. B
- M D
- L C
- P A
- K



Shape

Foundation Level %
Higher Level %

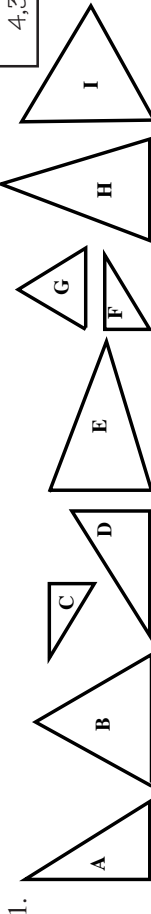
End-of-topic Assessment

Attempt all questions. Write the answers on this sheet.
The Foundation Level mark is the mark for the Foundation Section.
The Higher Level mark is the mark for both sections.

Foundation Section - Basic techniques

LEVEL 3

9 marks
4,3,2



1. (a) Give the letters of the right-angled triangles.
- (b) Give the letters of the equilateral triangles.
- (c) Give the letters of the isosceles triangles.

LEVEL 4

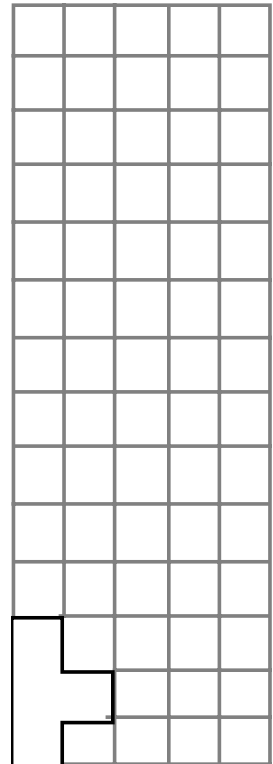
4 marks

2. List four pairs of **congruent triangles** (from Q1)

..... and and and and and

4 marks

3. Draw at least six more of these T-shapes to make a tessellation.



LEVEL 4

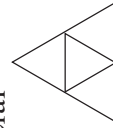
4. Draw two circles whose centres are 3 cm apart.
One circle must have radius 4cm.
The other circle must have diameter 6 cm.

5 marks

LEVEL 5

4 marks

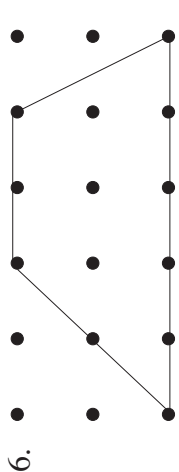
5. Construct 4 equilateral triangles to make a shape like this.



Each triangle must have sides 3 cm long.
Do *not* rub out the compass arcs.

LEVEL 6

8 marks



6.
 - (a) What is the name of this shape ?
.....
 - (b) Split this shape into a rectangle and two triangles.
.....
 - (c) What is the special name of this rectangle?
.....
 - (d) What kind of triangles are they ?
.....

6 marks

7. Draw :
 - a parallelogram a kite
 - an arrowhead

Higher Section - More difficult questions

20 marks

8. Match each of these polygons with its shape definition. Write the letter of the polygon which has been defined next to each definition. One has been done for you. Each shape has only one definition. Each definition has only one shape

Polygon	Shape Definition
A : Hexagon	3 sides. All sides equal.
B : Trapezium	4 equal sides. 4 right-angles. ...F...
C : Parallelogram	4 equal sides. No right-angles.
D : Equilateral triangle	4 sides. 2 pairs of opposite sides equal. 4 right angles
E : Octagon	4 sides. 2 pairs of opposite sides equal. No right angles.
F : Square	3 sides. Two sides equal.
G : Rhombus	4 sides. Two pairs of equal sides. Opposite sides not equal.
H : Isosceles Triangle	6 equal sides.
I : Kite	4 sides. One pair of opposite sides parallel.
J : Rectangle	6 sides. Sides may or may not be equal.
K : Regular hexagon	8 sides.....

Foundation Level Total / 40

Higher Level Total /60

Shape

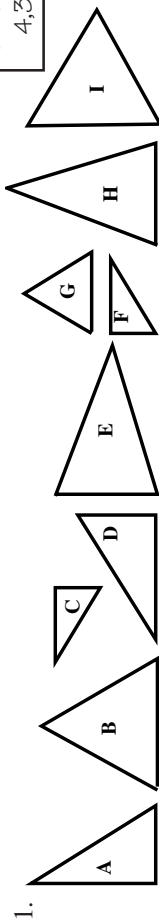
End-of-topic Assessment ANSWERS

Attempt all questions. Write the answers on this sheet.
 The Foundation Level mark is the mark for the Foundation Section.
 The Higher Level mark is the mark for both sections.

Foundation Section - Basic techniques

LEVEL 3

9 marks
4,3,2



- (a) Give the letters of the right-angled triangles. ...A C D F.....
 (b) Give the letters of the equilateral triangles. ...B I G.....
 (c) Give the letters of the isosceles triangles. ...E H.....

LEVEL 4

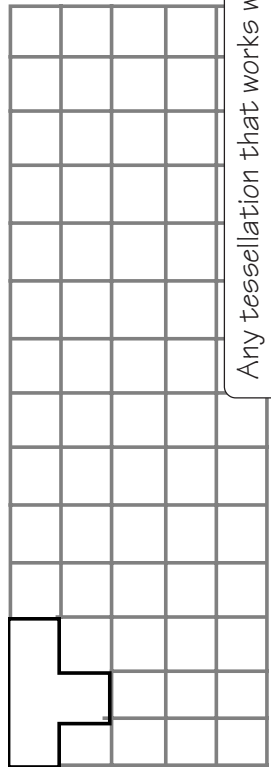
4 marks

2. List four pairs of **congruent triangles** (from Q1)

C and F A and D B and I E and H

4 marks

3. Draw at least six more of these T-shapes to make a tessellation.

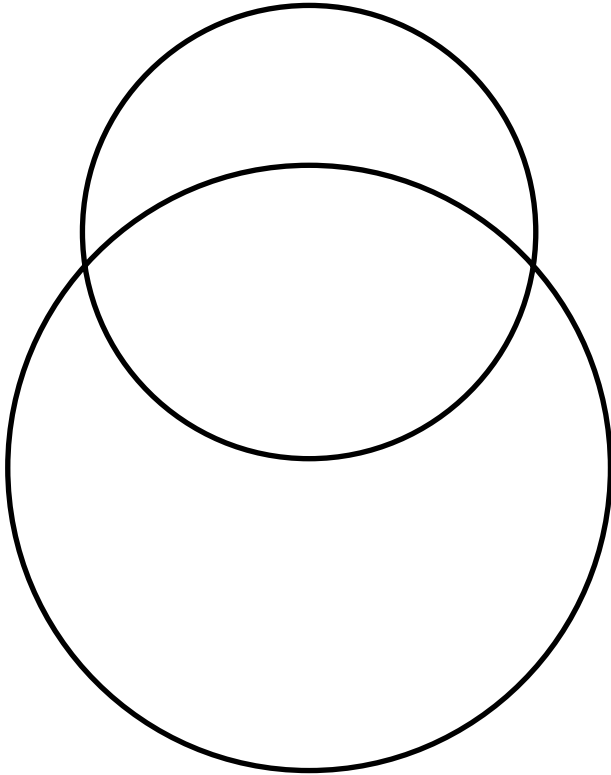


Any tessellation that works will do.
 Award part marks if it goes right for part of the diagram.

LEVEL 4

5 marks

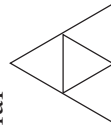
4. Draw two circles whose centres are 3 cm apart. (1)
 One circle must have radius 4cm. (2)
 The other circle must have diameter 6 cm. (2)



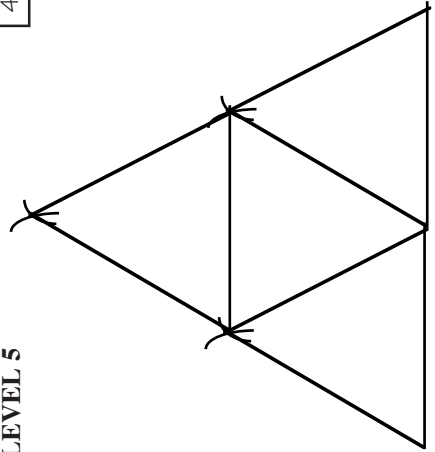
LEVEL 5

4 marks

5. Construct 4 equilateral triangles to make a shape like this.

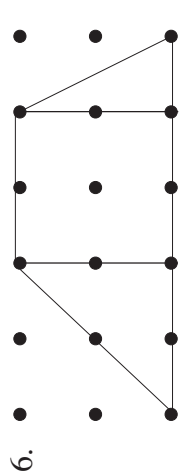


Each triangle must have sides 3 cm long.
 Do *not* rub out the compass arcs.



LEVEL 6

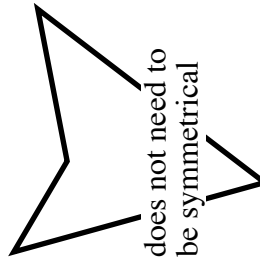
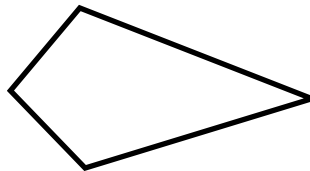
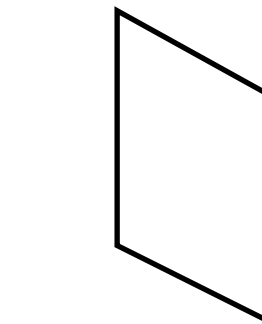
8 marks



6. (a) What is the name of this shape? ...trapezium....
 (b) Split this shape into a rectangle and two triangles. Note: a square is a rectangle
 (c) What is the special name of this rectangle? ...square...
 (d) What kind of triangles are they? ...right-angled...

6 marks

7. Draw :
 a parallelogram a kite an arrowhead



does not need to be symmetrical

Higher Section - More difficult questions

20 marks

8. Match each of these polygons with its shape definition. Write the letter of the polygon which has been defined next to each definition. One has been done for you. Each shape has only one definition. Each definition has only one shape

Polygon	Shape Definition
A : Hexagon	3 sides. All sides equal. D...
B : Trapezium	4 equal sides. 4 right-angles. F...
C : Parallelogram	4 equal sides. No right-angles. G...
D : Equilateral triangle	4 sides. 2 pairs of opposite sides equal. 4 right angles. J...
E : Octagon	4 sides. 2 pairs of opposite sides equal. No right angles. C...
F : Square	3 sides. Two sides equal. H...
G : Rhombus	4 sides. Two pairs of equal sides. Opposite sides not equal. I...
H : Isosceles Triangle	6 equal sides. K...
I : Kite	4 sides. One pair of opposite sides parallel. B...
J : Rectangle	6 sides. Sides may or may not be equal. A...
K : Regular hexagon	8 sides. E...

Foundation Level Total / 40

Higher Level Total /60

Shape

Date Name.....

I can do the following :

- Level 3 Q1 classify triangles
- Level 4 Q2 recognise congruent triangles
- Q3 make a tessellation
- Q4 construct circles to fit given information
- Level 5 Q5 construct equilateral triangles
- Level 6 Q6 name geometric shapes
- Q7 draw named quadrilaterals
- Q8 match polygons with their properties

The things I enjoyed most were

I would like more practice on.....

Pupil's comment (optional).....

Teacher's comment (optional)

Parent's comment (optional)

Assessment

Signature of teacher..... Signature of parent.....

Shape

Date Name.....

I can do the following :

- Level 3 Q1 classify triangles
- Level 4 Q2 recognise congruent triangles
- Q3 make a tessellation
- Q4 construct circles to fit given information
- Level 5 Q5 construct equilateral triangles
- Level 6 Q6 name geometric shapes
- Q7 draw named quadrilaterals
- Q8 match polygons with their properties

The things I enjoyed most were

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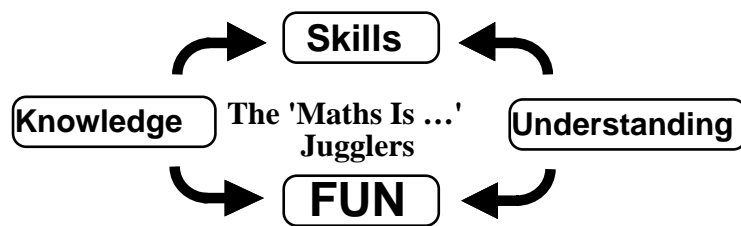
Pupil's comment (optional).....

Teacher's comment (optional)

Parent's comment (optional)

Assessment

Signature of teacher..... Signature of parent.....



Suggested Minor Modifications to the Jugglers KS3 Courses

in the light of what we now can expect students to know at the end of KS2

We need to take on board the facts that:

- pupils coming into Y7 will have better calculatory skills than in previous years – and this will be even more obvious with Y7s in the years to come.
- mental arithmetic should always be the first approach, followed by pencil-and-paper techniques (both informal and formal); calculators are only for the most complex calculations
- some of our new Y7 pupils will have achieved level 5 at KS2 and need to be stimulated, stretched and kept motivated
- since we will have KS2 NCT scores and level boundaries, as well as the levels achieved for each student coming into Y7, we ought to make sure that we offer work of an appropriate standard to every pupil
- students who have not achieved Level 4 at KS2 should follow the **Springboard 7 Course**, provided free by the DfEE, but written by the main author of these Y7 and Y8 texts, Barbara Young.

**The Y7 Big Edd Guide,
the Y8 Fission Guide
and the Y9 Optimistic Guide**

stretch the more able students way beyond what is required by the Framework.

Almost everything that is required in the Frameworks for Y7, Y8 and Y9 is delivered in these texts, but not always in the same year as in the Framework.

This booklet:

- suggests parts of the texts that should be omitted for more able students
- provides a list of some items that need to be done as mental starters (linked to relevant topics, where applicable)
- provides COPYMASTER worksheets that can be used to fill in the (few) gaps

KEEP THIS MASTER COPY IN YOUR TEACHERS' RESOURCE PACK

Suggested Modifications to Y7 Big Edd and Y7 Kooldood

Every school has a different type of intake and some of these modifications depend on the ability of the target students.

So, we define four target groups of students as follows, using their KS2 maths results as benchmarks:

Springboard	: below Level 4 (but it also works extremely well with students who have only achieved 4.0, 4.1, 4.2, 4.3 at KS2)
Kooldood	: Levels 4.0 – 4.6 (working with Kooldood)
Group 2	: Levels 4.3 – 4.9 (working with Big Edd)
Group 1	: Levels 5.0 and above (working with Big Edd)

From this you should be able to identify which of your students we are referring to in each case below.

Springboard students follow the Springboard course		Springboard students follow the Springboard course	
Topic	General comments	Kooldood	Group 2 Group 1
Sum Number Fun	Much of this has been covered at KS2. One idea is to do one week's work from this, followed by the test, as a diagnostic measure. After this, teachers can use the remaining puzzles for homeworks, or when only part of a class is present ...	Must review vocabulary for odd and even numbers, sum, product, difference and palindromes.	Must review vocabulary for odd and even numbers, sum, product, difference and palindromes. Omit sections 1 & 3 Do all of section 2. Use ideas from Section 4 as an oral introduction to Section 5. Do sections 5 –10
Area		Do all of the topic.	Omit sections 1 & 3 Do section 5–10
Journeys, Maps and Coordinates		Do all of the topic.	Do all of the topic.
Shape		Do all of the topic.	Do all of the topic.
Handling Data	Ban 'favourites' in the project. Suggest replace with project based on databases that students have placed on the computer, from their own surveys.	Do all of the topic.	Do all of the topic.

Topic	General comments	Kooldood	Group 2	Group 1
Fractions & Dec.	<p>The better students ought to leave out the most elementary work as they have done a lot of this at KS2.</p> <p>THERE ARE 5 NEW WORKSHEETS WHICH COVER MISSING ITEMS FROM THE Y7 FRAMEWORK</p>	<p>Do all of the topic.</p>	<p>Omit section 1</p> <p>Section 4: Do <u>P1 as an oral starter & D1 without a calculator</u> (may need to use 'chunking').</p> <p>Section 9 : D4,D5,D6 only</p>	<p>Omit sections 1,2,7,9.</p> <p>Section 4: Do <u>D1 without a calculator</u></p> <p>Do Section 8 without a calculator.</p>
Angle	<p>New oral/mental starters</p> <ol style="list-style-type: none"> Express a smaller number as a fraction of a larger one. (eg: 3 as a fraction of 12) Divide decimals by a single digit number. (do after Worksheet 3 : extend whole number techniques – eg $24 \div 3 = 8$ leading to $2.4 \div 3 = 0.8$) Divide an integer by a fraction (eg how many 0.2s are there in 1 ...) 	<p>Worksheet 1: Ordering fractions and decimals (all groups do before Section 8)</p> <p>Worksheet 2: Addition of decimals (all groups do before Section 8)</p> <p>Worksheet 3: Subtraction of decimals (all groups do before Section 8)</p> <p>Worksheet 4: Extending multiplication to decimals (all groups do before Section 8)</p> <p>Worksheet 5: Ratio and proportion (all groups do after Section 4)</p>		
Number Patterns	<p>THERE ARE 2 NEW WORKSHEETS WHICH COVER MISSING ITEMS FROM THE Y7 FRAMEWORK</p> <p>After worksheets 5 & 6 have been done these techniques should be practised using oral/mental starter time.</p> <p>New oral/mental starters</p> <ol style="list-style-type: none"> HCFs (higher common factors) after Sec 7 LCMs (lowest common multiples) anytime 	<p>Do all of the topic.</p>	<p>Omit Section 1</p> <p>Section 2 : do P1 →→</p> <p>Do Sections 3 – 12</p>	<p>Omit Section 1</p> <p>Section 2 : do P1 →→</p> <p>Do Sections 3 – 12</p>
Nets, Cubes & Vol.	<p>THERE IS 1 NEW WORKSHEET</p>	<p>Do all of the topic.</p>	<p>Section 1: omit D1</p> <p>Do Sections 2 – 8</p>	<p>Section 1: omit D1 and no calculator for rest</p> <p>Do Sections 2 – 8</p>
		<p>Worksheet 6: Simple sequences (do before section 6 (multiples) – orally for Group 1)</p> <p>Worksheet 7: Brackets (all groups – anywhere)</p>		
		<p>Do all of the topic.</p>	<p>Do all of the topic.</p>	<p>Do all of the topic.</p>
		<p>Worksheet 8: Surface areas of cubes, cuboids ... (all groups)</p>		

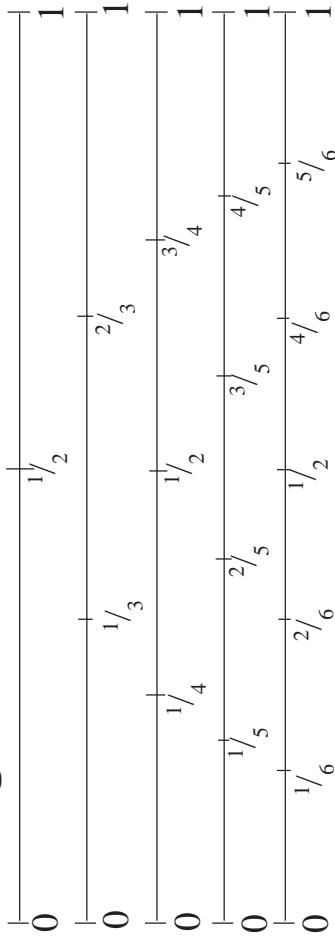
Worksheet 1: Ordering fractions and decimals

In this section you will:

- put fractions in order of size;
- review place values for tenths and hundredths;
- order decimals.

DEVELOPMENT

D1.1: Ordering fractions



Place in order, with the smallest first:

- $\frac{1}{2}$ $\frac{1}{4}$ $\frac{1}{3}$ $\frac{1}{6}$ $\frac{1}{5}$ $\frac{1}{10}$
- $\frac{1}{2}$ $1\frac{1}{2}$ 2 $\frac{1}{4}$ $2\frac{1}{4}$ $\frac{3}{4}$
- $1\frac{1}{3}$ $1\frac{2}{3}$ 2 $\frac{1}{4}$ $\frac{2}{3}$ $\frac{1}{2}$
- $\frac{1}{3}$ $\frac{2}{5}$ 1 $\frac{1}{4}$ $\frac{2}{3}$ $\frac{4}{5}$

• Check your answers.

D1.2: Ordering decimal tenths



1 1.1 1.2 1.3 1.4 1.5 1.6 1.7 1.8 1.9 2 2.1 2.2 2.3 2.4 2.5 2.6 2.7 2.8 2.9 3

Fill in the next four terms in each sequence:

- 1.6 1.8 2 2.2 2.7
- 1.3 1.5 1.7 1.9 2.5
- 1.1 1.4 1.7 2.3
- 3.4 3.6 3.8 4.2

Place in order, with the smallest first:

- 1.4 2.3 3.1 1.3 1.9 2.7
- 2.3 3.2 2.1 2.9 4.3 3.8
- 4.2 2.4 6.2 5.3 4.9 2.1

Write the number which is halfway between each pair of numbers:

- 1.4 1.8 9) 2.2 2.6 10) 1.7 2.1
- 4 4.8 12) 2.7 3.3

• Check your answers.

D1.3: Tenths and hundredths

tens units tenths hundredths

T U . t h
3 4 . 7 1



- In 34.71 the 3 stands for 30
In 34.71 the 4 stands for 4 units.
In 34.71 the 1 stands for 1 hundredth.

- In 63.7 (a) the 6 stands for
(b) the 7 stands for
- In 35.08 (a) the 0 stands for
(b) the 8 stands for
- In 1.70 (a) the 7 stands for
In 1.07 (b) the 7 stands for

0.6 = 6 tenths

0.60 = 60 hundredths or 6 tenths and 0 hundredths

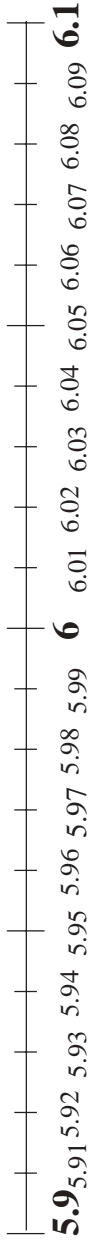
So 0.60 = 0.6 or, in fractions $\frac{60}{100} = \frac{6}{10}$

Complete these pairs of fractions:

4. $\frac{40}{100} = \frac{4}{\square}$ 5. $\frac{7}{10} = \frac{\square}{100}$ 6. $\frac{\square}{10} = \frac{90}{\square}$

• Check answers.

D1.4: Ordering decimal hundredths



5.9 5.91 5.92 5.93 5.94 5.95 5.96 5.97 5.98 5.99 6 6.01 6.02 6.03 6.04 6.05 6.06 6.07 6.08 6.09 6.1

Fill in the next four terms in each sequence:

- 5 5.93 5.96 5.99 6.04
- 5.94 5.96 5.98 6 6.02
- 7.96 7.99 8.02 8.05
- 2.45 2.47 2.49 2.51

Place in order, with the smallest first:

- 1.45 1.47 1.42 2.1 1.4 1.5
- 3.25 3.2 3.23 3.16 2.95 3.5
- 3.41 3.14 3.44 3.15 1.34 3.43

Write the number which is halfway between each pair of numbers:

- 5.94 5.96 9) 5.8 5.9

• Check your answers.

CHALLENGES

You may do these challenges in any order.

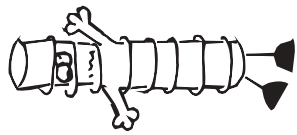
Star Challenge 8

9-10 correct = 2 stars
7-8 correct = 1 star

Decimal sequences

Write in the next four terms for each sequence.

- 1) 5 5.5 6
- 2) 2.4 2.6 2.8
- 3) 3.7 4 4.3
- 4) 2.15 2.18 2.21
- 5) 2 2.02 2.04
- 6) 10.1 10.3 10.5
- 7) 8.2 8.4 8.6
- 8) 8.02 8.04 8.06
- 9) 5.99 6.01 6.03
- 10) 4.85 4.87 4.89



Inaspin

• Your teacher will need to check these.

Star Challenge 9

All correct = 1 star

Putting numbers in their place

1. **7.5 8.3 7.9 8.8 7.1**

Put these numbers in the correct places on the line above.
Use arrows to mark their positions clearly.

2. **3.85 3.89 3.92 3.99 3.95**

Put these numbers in the correct places on the line above.
Use arrows to mark their positions clearly.

• Your teacher will need to check these.

Worksheet 2: Addition

In this section you will:

- add simple decimals
- practise written methods of addition of whole numbers
- extend written addition methods to two decimals

DEVELOPMENT

D2.1: Mental addition of simple decimals

EXAMPLE Work out $2.3 + 1.4$

$$2.3 + 1.4 = 3.7$$

$$\begin{array}{r} 23 + 14 = 37 \\ \hline \end{array}$$

$$\text{So, } 2.3 + 1.4 = 3.7$$

Work out :

- $0.2 + 0.3 = \dots\dots\dots$
 - $1.2 + 0.3 = \dots\dots\dots$
 - $0.5 + 0.5 = \dots\dots\dots$
 - $1.2 + 1.4 = \dots\dots\dots$
 - $0.8 + 1.1 = \dots\dots\dots$
 - $2.5 + 0.5 = \dots\dots\dots$
 - $1.6 + 0.4 = \dots\dots\dots$
 - $2.3 + 3.5 = \dots\dots\dots$
 - $4.2 + 5.7 = \dots\dots\dots$
- Check your answers.

D2.2 : Standard written method of addition

EXAMPLE Work out $137 + 13 + 173$

$$\begin{array}{r} 137 \\ 13 \\ + 173 \\ \hline 323 \\ \hline 111 \\ \hline \end{array}$$

Stack carefully

You don't have to use the HTU headings.

But you must stack the numbers correctly

Show your "carry" figures clearly

Work out the answers to these additions.

1. $2492 + 1341$

2. $2058 + 612 + 39$

3. $4731 + 19 + 3120$

• Check your answers.

D2.3: Adding decimals

EXAMPLE

$$\begin{array}{r} \text{U. t} \\ 72.3 \\ + 23.8 \\ \hline 96.1 \\ \hline 1 \end{array}$$

Stack carefully.
Put units under units.
Put decimal points in line.
Put tenths under tenths....

Show your "carry" figures clearly

Work out $72.3 + 23.8$

Then, add as for whole numbers.



Task 1: Complete these additions:

1. $31.6 + 43.5$

2. $2.48 + 1.31$

3. $62.5 + 23.7$

4. $54.62 + 37.53$

$$\begin{array}{r} 31.6 \\ + 43.5 \\ \hline \end{array}$$

$$\begin{array}{r} 2.48 \\ + 1.31 \\ \hline \end{array}$$

$$\begin{array}{r} 62.5 \\ + 23.7 \\ \hline \end{array}$$

$$\begin{array}{r} 54.62 \\ + 37.53 \\ \hline \end{array}$$

CHECK YOUR ANSWERS. See your teacher if you have any wrong.

Task 2: Work out the answers to these additions.

5. $13.7 + 54.2$

6. $7.64 + 2.32$

7. $63.6 + 24.8$

8. $24.35 + 32.67$

• Check your answers.

CHALLENGES

You may do these challenges in any order.

Show your answers (and any working) in your exercise book.

Star Challenge 6

All correct = 1 star

Lengths of lines

In each case, work out the length of the line AC.



- A 5 cm B 3 cm C



- A 6.2 cm B 2.3 cm C



- A 4.5 cm B 2.5 cm C



- A 7.3 cm B 2.8 cm C



- A 10.3 cm B 7.9 cm C



- A 4.7 cm B 3.5 cm C

• Your teacher needs to check these.

Star Challenge

7 correct = 2 stars
5-6 correct = 1 star

1. Peter goes to the cinema with his mother.
Peter is 6 years old.

How much does it cost for both of them ?

2. Katy buys a birthday present for her little brother.
She buys a big colouring book. The price is £1.85
She buys a box of crayons. The price is £0.64

How much did the birthday present cost ?

3. Parva goes to the zoo with her father.
Parva is twelve years old.

How much does it cost for both of them ?

4. Ann goes to the zoo with her 14 year old twin brother.

How much does it cost for both of them ?

5. Stella buys a large toy dog and a
medium toy dog in the sale.

How much did she pay altogether ?

6. Tom buys two medium toy dogs in the sale.

How much did he pay altogether ?

7. Jenny buys a large toy dog and a small toy dog in the sale.

How much did she pay altogether ?

• *Your teacher needs to check these.*

Rex Cinema Prices

Adults £4.60
Children £2.25



Zoo Entrance Prices

Adults £8.25
Children £3.45

*Children must be
15 or under*

!! TOY DOG SALE !!

! Prices slashed !

Large dog £8.50 £4.82
Medium dog £5.50 £2.75
Small dog £3.75 £1.99

Star Challenge

17-19 correct = 2 stars
14-16 correct = 1 star

Decimal arithmetic

Work out:

1. $0.3 + 0.5$
2. $2.8 + 0.5$
3. $1.3 + 1.5$
4. $4.2 + 2.8$
5. $2.31 + 3.15$
6. $4.25 + 5.42$
7. $6.84 + 1.27$
8. $3.25 + 1.75$
9. Double 0.4
10. Double 1.3
11. Double 2.5
12. Double 1.6
13. Double 0.45
14. Double 1.41
15. Double 3.24
16. Double 1.33
17. $2.5 + 2.7$
18. $3.5 + 3.6$
19. $2.7 + 2.9$
20. Double 1.25

• *Your teacher needs to check these.*

Worksheet 3: Subtraction

In this section you will:

- mentally subtract simple decimals
- practise written methods of subtraction of whole numbers
- extend written subtraction methods to two decimals

DEVELOPMENT

D3.1: Mental subtraction of simple decimals

EXAMPLE Work out $2.6 - 1.4$

$$2.6 - 1.2 = 1.4$$

$$2.6 - 1.4 = 1.2$$

$$\text{So, } 2.6 - 1.4 = 1.2$$

Work out:

- $0.5 - 0.3 = \dots\dots\dots$
 - $1.7 - 0.3 = \dots\dots\dots$
 - $3.5 - 0.5 = \dots\dots\dots$
 - $1.9 - 1.4 = \dots\dots\dots$
 - $1.1 - 0.9 = \dots\dots\dots$
 - $2.5 - 1.5 = \dots\dots\dots$
 - $1.6 - 0.4 = \dots\dots\dots$
 - $3.7 - 2.5 = \dots\dots\dots$
 - $9.7 - 5.3 = \dots\dots\dots$
- Check your answers.

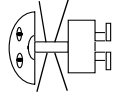
D3.2: Standard written method of subtraction

EXAMPLES

$$\begin{array}{r} 4 \ 5 \ 7 \\ - 3 \ 2 \ 3 \\ \hline 1 \ 3 \ 4 \end{array}$$

$$\begin{array}{r} 5 \ 4 \ 3 \\ - 3 \ 2 \ 7 \\ \hline 2 \ 1 \ 6 \end{array}$$

You can't subtract 7 from 3, so you take a 10 from the tens column



Do-med

Task 1: Complete these subtractions.

Stack the numbers in the correct columns. Show all working.

$$1. \quad \begin{array}{r} 258 - 123 \\ 2. \quad \begin{array}{r} 573 - 247 \\ 3. \quad \begin{array}{r} 892 - 346 \\ 4. \quad \begin{array}{r} 654 - 237 \end{array} \end{array} \end{array}$$

$$\begin{array}{r} 2 \ 5 \ 8 \\ - 1 \ 2 \ 3 \\ \hline 5 \ 7 \ 3 \\ - 2 \ 4 \ 7 \\ \hline \end{array}$$

Task 2: Write each of these as in questions 1–4

Stack the numbers in the correct columns. Work out the answers.

$$5. \quad \begin{array}{r} 635 - 118 \\ 6. \quad \begin{array}{r} 556 - 264 \\ 7. \quad \begin{array}{r} 482 - 176 \end{array} \end{array}$$

D3.3: Subtracting decimals

EXAMPLE

$$\begin{array}{r} \text{U} \cdot \text{t} \\ 6 \ 7 \ 1 \ 3 \\ - 3 \cdot 8 \\ \hline 3 \cdot 5 \end{array}$$

Work out $7.3 - 3.8$

- Stack carefully.
- Put units under units.
- Put decimal points in line.
- Put tenths under tenths...

Then, subtract as for whole numbers.



Driller

Task 1: Complete these subtractions:

$$1. \quad \begin{array}{r} 5.3 - 3.2 \\ 2. \quad \begin{array}{r} 4.7 - 2.5 \\ 3. \quad \begin{array}{r} 5.68 - 1.41 \\ 4. \quad \begin{array}{r} 4.5 - 2.7 \\ 5. \quad \begin{array}{r} 5.62 - 2.53 \end{array} \end{array} \end{array}$$

$$\begin{array}{r} 5 \cdot 3 \\ - 3 \cdot 2 \\ \hline 4 \cdot 7 \\ - 2 \cdot 5 \\ \hline 5 \cdot 6 \ 8 \\ - 1 \cdot 4 \ 1 \\ \hline 4 \cdot 5 \\ 5 \cdot 6 \ 2 \end{array}$$

CHECK YOUR ANSWERS. See your teacher if you have any wrong.

Task 2: Work out the answers to these subtractions.

$$6. \quad \begin{array}{r} 5.7 - 3.9 \\ 7. \quad \begin{array}{r} 7.64 - 2.12 \\ 8. \quad \begin{array}{r} 5.6 - 2.8 \\ 9. \quad \begin{array}{r} 5.35 - 2.67 \end{array} \end{array} \end{array}$$

• Check your answers.

CHALLENGES

You may do these challenges in any order.

Show your answers (and any working) in your exercise book.

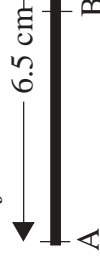
Star Challenge

Lengths of shorter lines

EXAMPLE



In each case, calculate the length of the line AB.



Star Challenge 10

5-6 correct = 1 star

Adding and subtracting money



1. Alan has £4.70 He spends £2.30
How much does he have left ?
2. Carol goes to the cinema. She pays £1.80 in bus fares. She pays £4.25 to see the film.

- (a) How much does she pay altogether ?
- (b) How much change does she have from £8 ?

DISCO PRICES	
Saturday	£7.25
Mon-Friday	£5.40

3. Sue has £9.50 She goes to the disco on Saturday.

How much does she have left to spend ?

4. Bob goes to the disco on Thursday.

How much more would it have cost him, if he had gone on Saturday ?

5. Sally spent £3.24 on Friday. She spent £1.36 on Saturday.

How much did she spend altogether ?

6. Erroll had saved £8.60. He spent £3.45

How much did Erroll have left ?

• Your teacher needs to check these.

Star Challenge 11

5 correct = 2 stars

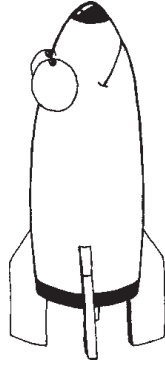
4 correct = 1 star

On board the Pan-Galactic Starships



The Pan-Galactic Explorers come from many star systems.

On board the starships, all the Explorers are paid in Credits. 1 Credit = 100 cents



1. On the first day of the trip, Qwerk earned 3.48 Credits. Qwerk also earned 4.24 Credits on the second day.

Qwerk

How many Credits did Qwerk earn altogether ?

2. By the third day, Sludge had 12.62 Credits. Then, Sludge spent 5.55 Credits playing Galacton.



Sludge

How many Credits did Sludge have left ?



Fission

3. On the fifth day, Fission only worked half the day. Fission earned 6.35 Credits and spent 4.18 Credits.

How much did Fission gain overall ?

4. By the sixth day Qwerk had earned 15.60 Credits. Qwerk spent 14.85 credits on computer games.



Pow

How many Credits did Qwerk have left ?

5. On the tenth day, Optymistic earned 13.25 Credits and spent 15.30 Credits on new clothes.



Optymistic

How much more did Optymistic spend than he earned ? • Your teacher needs to check these.

Worksheet 4: Multiplication

In this section you will:

- develop multiplication techniques for HTU x U and extend to U.t x U

DEVELOPMENT

D4.1: Multiplication by stacking

With the grid method, to find 735×6

you worked out 700×3 , 30×6 and 5×6 and added the results.

Here is another way of setting out questions like these.

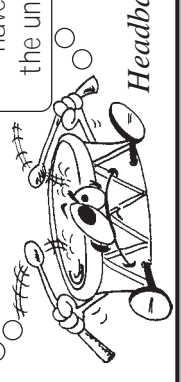
EXAMPLE $735 \times 6 = ?$

$$\begin{array}{r} 735 \\ \times 6 \\ \hline 30 \\ 180 \\ 4200 \\ \hline 4410 \end{array}$$

Adding

You don't have to put this column in - but it helps have to multiply the units first in D2

Get used to multiplying the units first. You will have to multiply the units first in D2



Headbanger

Work out each of these, using the stacking method:

- 241×3
- 342×5
- 175×7
- 581×8

• Check your answers.

D4.2: Multiplication

$253 \times 4 = ?$

$$\begin{array}{r} 253 \\ \times 4 \\ \hline 1012 \\ 21 \\ \hline \end{array}$$

Step 1
 $4 \times 3 = 12$
2 down, carry 1

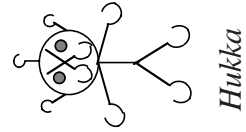
$$\begin{array}{r} 253 \\ \times 4 \\ \hline 1012 \\ 21 \\ \hline \end{array}$$

Step 2
 $4 \times 5 = 20$
Add 1 makes 21
1 down carry 2

$$\begin{array}{r} 253 \\ \times 4 \\ \hline 1012 \\ 21 \\ \hline \end{array}$$

Step 3
 $4 \times 2 = 8$
Add 2 makes 10

$$\begin{array}{r} 253 \\ \times 4 \\ \hline 1012 \\ 21 \\ \hline \end{array}$$



1. 215×3

$$\begin{array}{r} 215 \\ \times 3 \\ \hline \end{array}$$

2. 324×3

$$\begin{array}{r} 324 \\ \times 3 \\ \hline \end{array}$$

3. 547×5

4. 823×6

5. 294×7

• Check your answers.

D4.3: Multiplying money and measurements

$$\begin{array}{r} 120 \\ \times 3 \\ \hline 360 \end{array}$$

$$\begin{array}{r} 1.20 \\ \times 3 \\ \hline 3.60 \end{array}$$

So, $\pounds 1.20 \times 3 = \pounds 3.60$

units in answer go under units in question
Put decimal point in answer under the decimal point in the question

Do-med

Complete:

1. $\pounds 3.20 \times 3$

$$\begin{array}{r} 3.20 \\ \times 3 \\ \hline \end{array}$$

2. $\pounds 5.40 \times 3$

$$\begin{array}{r} 5.40 \\ \times 3 \\ \hline \end{array}$$

3. $\pounds 3.50 \times 7$

$$\begin{array}{r} 3.50 \\ \times 7 \\ \hline \end{array}$$

4. $4.6 \text{ m} \times 8$

$$\begin{array}{r} 4.6 \\ \times 8 \\ \hline \end{array}$$

5. $5.3 \text{ m} \times 6$

$$\begin{array}{r} 5.3 \\ \times 6 \\ \hline \end{array}$$

6. $\pounds 9.60 \times 5$

7. $\pounds 7.10 \times 6$

8. $6.2 \text{ m} \times 7$

9. $\pounds 8.60 \times 5$

10. $4.9 \text{ m} \times 3$

CHALLENGES

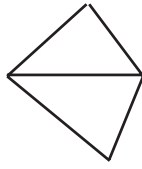
You may do these challenges in any order.

Show your answers (and any working) in your exercise book.

Star Challenge

6 correct = 2 stars
4-5 correct = 1 star

Using multiplication to solve problems



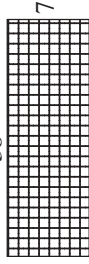
- Trendy Sports sells ping pong balls to shops. They are sold in boxes shaped like pyramids. Each box holds 5 balls. The Flashy Sports Shop buys 135 boxes of ping pong balls. Fred works at Flashy Sports. Fred wants to work out how many balls they have bought. He works out the answer to 135×5 .
What answer should he get?

- The Bulk Sports Factory makes ping pong balls. The balls are packed in boxes of 144. Trendy Sports buys 7 boxes.
Work out how many ping pong balls there are in 7 boxes. Show all working.

- Bill sells TVs in his shop. He buys the TVs from a wholesaler.

Bill buys some large screen TVs costing $\pounds 357$ each. **Work out the cost of 5 TVs.**

- To find the number of tiles on this floor, you work out 38×7 . **How many tiles are there?**



- Sam wants to measure the length of his lawn. He lays garden canes end to end. Each cane is 1.7 m long. His lawn is 9 canes long.

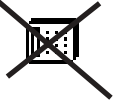
How long is the lawn in metres?

• Your teacher needs to check these.

Star Challenge 4

14 marks = 2 stars
11-13 marks = 1 star

Different totals



6 x

1. (a) Make multiplications like this

using the digits **2, 3, 5** in the boxes

There are six different answers. (6 marks)

- (b) What is the *largest* answer you can get? (1 mark)

2. (a) Make six different multiplications like this using the digits **3, 4, 7** (6 marks)

6 x

- (b) What is the *smallest* answer you can get? (1 mark)

• Your teacher needs to check these.

Star Challenge 5

All correct = 1 star



'Real life' problems

Show all working.

1. A garden cane is 1.3 m long. My lawn is exactly 6 canes long.

How long is the lawn in metres?

2. My shoe is 0.3 m long. The garden path is 9 shoe lengths long.

How long is the garden path?

3. My pencil is 9.2 cm long. My desk is 6 pencil lengths wide.

How wide is the desk in cm?

4. One brick is 8.5 cm wide. 7 bricks are placed side by side, with 1 cm of mortar in between.

Work out the distance across the 7 bricks.

• Your teacher needs to check these.

Star Challenge 6

All correct = 1 star



Arithmetic puzzles

1. Work out the missing number.

$$3 \times \dots + 7 = 25$$

2. Work out the two missing signs.

$$3 \dots 14 \dots 5 = 37$$

3. Work out the missing digit. 2 5 ...

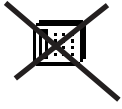
$$\begin{array}{r} 25 \\ \times 4 \\ \hline 1036 \end{array}$$

• Your teacher needs to check these.

Worksheet 6: Simple sequences

In this section you will:

- recognise and extend number sequences formed by counting from a number in steps of a constant size;
- extend beyond zero when counting back;
- recognise and explain patterns in sequences.



DEVELOPMENT

D6.1: Counting on and back in small steps

Complete each sequence:

- 4 7 10 Rule: add 3
- 52 55 58 Rule: add 3
- 49 54 Rule: add 5
- 73 77 Rule: add 4

Complete each sequence and rule:

- 55 58 61 Rule: add ... β .
- 44 39 34 Rule: subtract ...
- 99 96 93 Rule: subtract ...

• Check your answers.

D6.2 : Counting on and back in 6s

Complete each sequence:

- 6 12 18 Rule: add 6
- 21 27 33 Rule: add 6
- 50 56 Rule: add 6
- 32 Rule: subtract 6
- 100 Rule: subtract 6
- -3 15 Rule: subtract 6



Now, complete each sequence by counting BACK in 6s:

- 52 46 Rule: subtract 6
- 20 14 Rule: subtract 6
- 5 -1 Rule: subtract 6
- 0 -6 Rule: subtract 6

• Check answers.

D6.3: Counting on and back in 9s

Some people find it easier to add 10 then subtract 1

Complete each sequence by adding or subtracting 9s:

- 9 18 27 Rule: add 9
- 30 39 Rule: add 9
- 65 Rule: add 9
- 63 72 Rule: subtract 9
- 60 Rule: subtract 9
- 3 12 Rule: subtract 9

Now, complete each sequence by counting BACK in 9s:

- 50 41 Rule: subtract 9
- 6 Rule: subtract 9
- 0 -9 Rule: subtract 9
- 100 91 Rule: subtract 9

• Check your answers.

D6.4: Rules for counting on and counting back

Complete each sequence and rule:

- 4 12 Rule: add 8
- 5 12 Rule: add 7
- 21 27 Rule: add 6
- 83 74 65 Rule: subtract 9
- 78 70 62 Rule: subtract 8
- 26 -20 Rule: subtract 6
- 18 29 Rule: subtract 11
- 19 -13 Rule: subtract 6
- 15 24 33 Rule: subtract 9
- 50 75 100 Rule: subtract 25

• Check your answers.

Worksheet 7: Brackets

In this section you will :

- do calculations involving brackets
- choose appropriate methods for doing calculations.

DEVELOPMENT

D7.1: Using brackets

Rule: work out the brackets first.



Headbanger

EXAMPLE Work out $3 + (4 \times 2)$

$$\begin{array}{c} \text{Hukka} \\ \circ \quad \circ \quad \circ \quad \circ \quad \circ \\ 4 \times 2 = 8 \quad \circ \quad \circ \\ 3 + 8 = 11 \end{array}$$

So, $3 + (4 \times 2) = 11$

Work out the value of each expression in your head.

Write your answers in your exercise book.

- $2 + (3 \times 10)$
- $(2 + 3) \times 10$
- $2 \times (3 + 10)$
- $(2 \times 3) + 10$
- $(5 \times 4) - 2$
- $5 \times (4 - 2)$
- $4 + (20 \div 4)$
- $(4 + 20) \div 4$
- $(100 \div 50) \times 2$

• Check your answers.

D7.2: Brackets and letters

EXAMPLE $(a - 3) \times 2 = 14$ What is a ?

$$\begin{array}{c} \text{Do-med} \\ \circ \quad \circ \quad \circ \quad \circ \quad \circ \\ 7 \times 2 = 14 \quad \circ \quad \circ \\ 10 - 3 = 7 \end{array}$$

Do-med

Write the answer like this.

$$a = 10$$

Work out the value of each letter.

Work it out in your head or use pencil-and-paper techniques.

Write your answers in your exercise book.

- $(3 \times 10) + b = 35$
- $3 \times (10 + c) = 36$
- $(25 \div d) + 3 = 8$
- $(e + 1) \div 2 = 3$
- $(f \times 3) - 10 = 11$
- $g \times (15 - 4) = 55$
- $6 + (h \div 3) = 13$
- $(5 + i) \times 5 = 100$
- $(100 \div j) + 25 = 75$

• Check your answers.

CHALLENGES

You may do these challenges in any order.

Show your answers (and any working) in your exercise book.

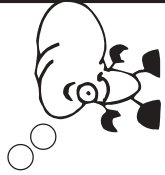
Star Challenge 5

Choose an appropriate method

Work out the value of each letter.

In your head?
On paper?

With a calculator?
YOU DECIDE for each question.



Big Edd

- $(14 \times 50) + k = 725$
- $17 \times (283 - 236) = 1$
- $(45 \times 4) + m = 190$
- $(n - 1) \div 2 = 24$
- $(u + 3) - 4 = 6$
- $(23 + v) \div 9 = 5$
- $w + (12 \times 17) = 220$
- $(m + 1) \times 5 = 30$

• Your teacher needs to check these.

Star Challenge 6

A monster puzzle

Copy each calculation.

Replace each with +, -, x, or ÷

- $423 \quad \square \quad 3 = 1269$
- $858 \quad \square \quad 6 = 143$
- $143 \quad \square \quad 159 = 302$
- $(240 \quad \square \quad 3) - 20 = 60$
- $47 \quad \square \quad (5 - 2) = 141$
- $(141 \quad \square \quad 1) \quad \square \quad 10 = 130$
- $(75 \quad \square \quad 23) \quad \square \quad 18 = 70$
- $(17 \quad \square \quad 5) \quad \square \quad 10 = 75$
- $(2 \quad \square \quad 11) \quad \square \quad 2 = 20$
- $(500 \quad \square \quad 5) \quad \square \quad 5 = 95$



Shelob

9-10 correct = 2 stars
7-8 correct = 1 star

• Your teacher needs to check these.

Worksheet 8: Surface areas

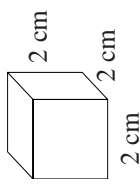
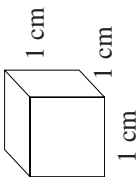
In this section you will :

- calculate the surface areas of shapes made from cubes
- calculate the surface areas of cubes and cuboids

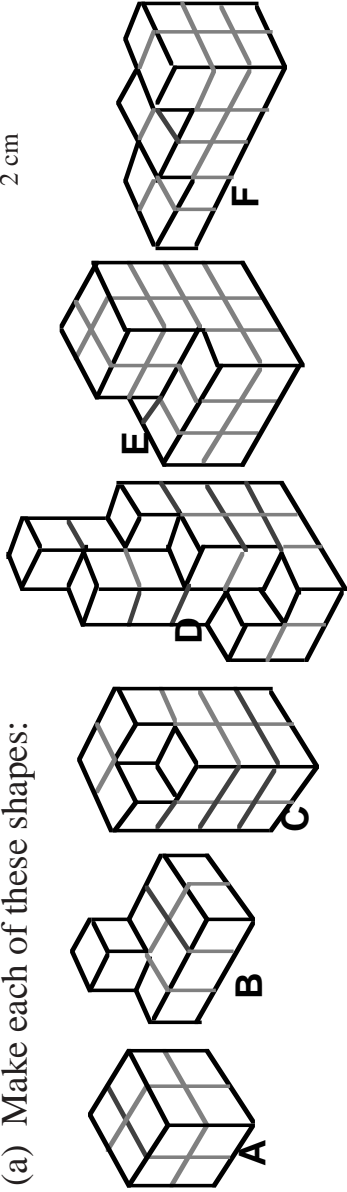
DEVELOPMENT

D8.1: Introducing surface areas

- How many faces does a cube have ?
.....
 - What is the area of one face of this cube ?
.....
 - What is the surface area of the whole cube ?
.....
- Calculate the surface area of this cube.
.....



- Make each of these shapes:



- Work out the surface area of each shape.

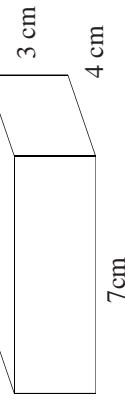
A: B: C:
D: E: F:

• Check your answers.

D8.2: Surface areas of cuboids

- This cuboid has six faces.
2 like this: 2 like this:
2 like this: 2 like this:

Work out the surface area of each face and hence find the surface area of the cuboid.



- Work out the surface area of this cuboid.

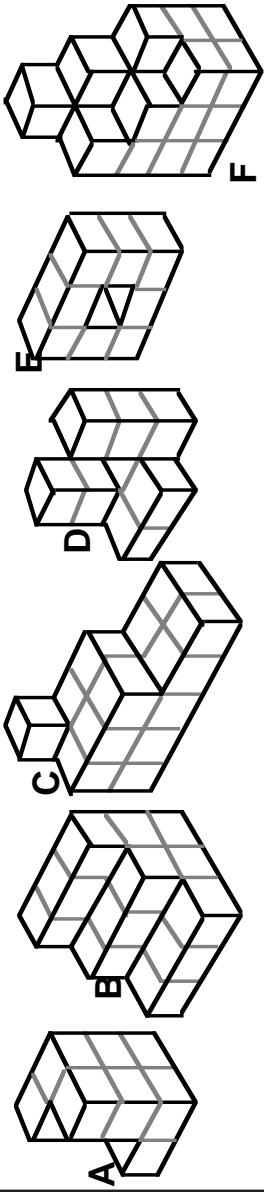
• Check your answers.

Star Challenge

8-9 correct = 2 stars
6-7 correct = 1 star

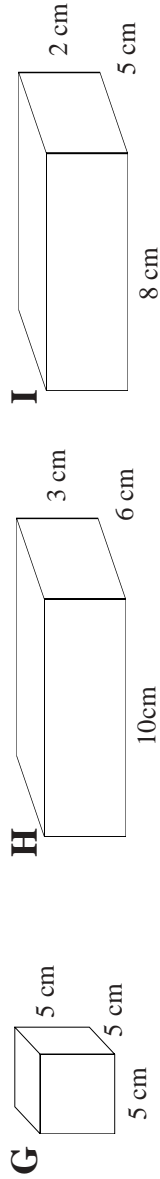
Surface area mixture

Work out the surface area of each of these shapes. Assume each square face is 1 cm by 1 cm.



A: B: C:

D: E: F:



G: H: I:

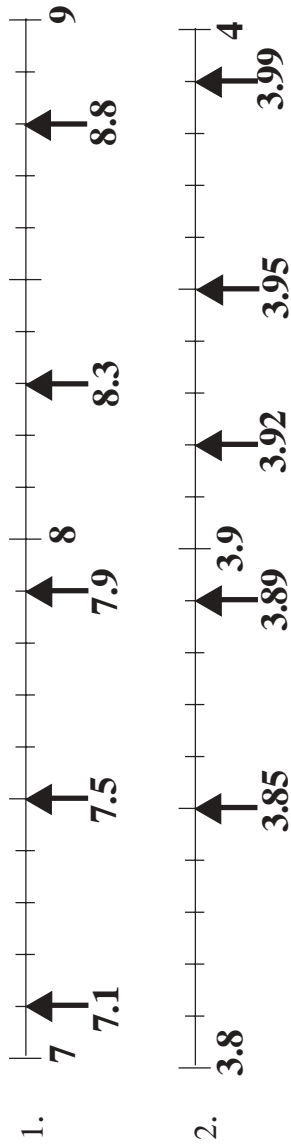
• Your teacher has the answers to these.

Worksheet 1 Star Challenge Answers

Decimal sequences

- 1) 6.5 7 7.5 8 3 3.2 3.4 3.6
- 3) 4.6 4.9 5.2 5.5 4) 2.24 2.27 2.3 2.33
- 5) 2.06 2.08 2.1 2.12 6) 10.7 10.9 11.1 11.3
- 7) 8.8 9 9.2 9.4 8) 8.08 8.1 8.12 8.14
- 9) 6.05 6.07 6.09 6.11 10) 4.91 4.93 4.95 4.97

Putting numbers in their place



All correct = 1 star

9-10 correct = 2 stars
7-8 correct = 1 star

8-8

Worksheet 2 Star Challenge Answers

Money problems

1. £6.85 2. £2.49 3. £11.70 4. £6.90 5. £7.57 6. £5.50 7. £6.81

18-20 correct = 2 stars
15-17 correct = 1 star

7-7

8-8

Decimal arithmetic

1. 0.8 2. 3.3 3. 2.8 4. 7 or 7.0 5. 5.46 6. 9.67
7. 7.11 8. 5 or 5.0 9. 0.8 10. 2.6 11. 5 or 5.0 12. 3.2
13. 0.9 14. 2.82 15. 6.48 16. 2.66 17. 5.2 18. 7.1
19. 5.6 20. 4.5

7 correct = 2 stars
5-6 correct = 1 star

Worksheet 3 Star Challenge Answers

Lengths of shorter lines

1. 6.3 cm 2. 3.9 cm 3. 3.4 cm 4. 0.4 cm

Adding and subtracting money

1. £2.40 2. (a) £6.05 (b) £2.25 3. £2.25 4. £1.85 5. £4.60 6. £5.15

On board the Pan-Galactic Starships

1. 7.72 cr 2. 7.07 cr 3. 2.17 cr 4. 0.75 cr 5. 2.25 cr

9

10

11-11

5-6 correct = 1 star
5 correct = 2 stars
4 correct = 1 star

Worksheet 4 Star Challenge Answers

Different totals

1. (a) $\begin{array}{r} 235 \\ \times 6 \\ \hline 1410 \end{array}$ 253 $\begin{array}{r} 325 \\ \times 6 \\ \hline 1950 \end{array}$ 352 $\begin{array}{r} 523 \\ \times 6 \\ \hline 3138 \end{array}$ 532
- (b) largest is 3192
2. (a) $\begin{array}{r} 34 \\ \times 7 \\ \hline 238 \end{array}$ 43 $\begin{array}{r} 37 \\ \times 4 \\ \hline 148 \end{array}$ 73 $\begin{array}{r} 47 \\ \times 3 \\ \hline 141 \end{array}$ 74
- (b) smallest is 141

'Real-life' problems

1. 7.8 m 2. 2.7 m 3. 55.2 cm 4. 65.5 m

Arithmetic puzzles

1. 6 2. x and - 3. 9

All correct = 1 star

All correct = 1 star

4-4

10

Worksheet 5 Star Challenge Answers

Ratio problems

Mike's money	Father's money	Total money
£1	£4	£5
£2	£8	£10
£5	£20	£25
£10	£40	£50
£20	£80	£100

1. For every £1 Mike earns, his father gives him £4. The amount his father gives Mike is four times the amount Mike earns. The ratio of father's money to Mike's earnings is 4 to 1.
2. To go with two cans of red paint, she needs 6 cans of red paint. The number of cans of white paint is 3 times the number of cans of red paint. How many cans of red paint should she start with? 3

All correct = 1 star

Worksheet 6 Star Challenge Answers

30 correct = 2 stars
27-29 correct = 1 star

- 80 71 62 53 44 35
-12 -4 4 12 20 28
3 6 12 24 48 96
75 75 69 63 57 51
-28 -21 -14 -7 0 7
2 3 5 9 17 33

50-52 correct = 2 stars
42-49 correct = 1 star

- 43 51 59 67 75 83 91 Rule: add 8
- 34 45 56 67 78 89 100 Rule: add 11
- 150 175 200 225 250 275 300 Rule: add 25
- 5 30 55 80 105 130 155 Rule: add 25
- 90 81 72 63 54 45 36 Rule: subtract 9
- 3 3 9 15 21 27 33 Rule: add 6
- 30 -21 -12 -3 6 15 24 Rule: add 9
- 9 15 21 27 33 39 45 Rule: add 6
- 60 52 44 36 28 20 12 Rule: subtract 8
- 20 13 6 -1 -8 -15 -22 Rule: subtract 7

All correct = 1 star

- Task 1:** add 9 **Task 3:** correctly shading 15, 22, 29, 36, 43 ...
Task 3: diagonal lines going down to the left.

Worksheet 7 Star Challenge Answers

11-12 correct = 2 stars
9-10 correct = 1 star

Choose an appropriate method

- $k = 25$
- $l = 3619$
- $m = 10$
- $n = 13$
- $u = 7$
- $v = 22$
- $w = 16$
- $m = 5$

9-10 correct = 2 stars
7-8 correct = 1 star

A monster puzzle

- x
- \div
- +
- \div
- x
-
- +
- x -
- x -
- \div -

Worksheet 8 Star Challenge Answers

8-9 correct = 2 stars
6-7 correct = 1 star

Surface area mixture

- A: 32 cm² B: 48 cm² C: 46 cm² D: 31 cm² E: 32 cm² F: 54 cm²
G: 150 cm² H: 216 cm² I: 132 cm²

ANSWERS

ANSWERS

Worksheet 1: Ordering fractions & dec.

D1.1: Ordering fractions

- $\frac{1}{10}, \frac{1}{6}, \frac{1}{5}, \frac{1}{4}, \frac{1}{3}, \frac{1}{2}$
- $\frac{1}{4}, \frac{1}{2}, \frac{3}{4}, 1\frac{1}{2}, 2, 2\frac{1}{4}$
- $\frac{1}{4}, \frac{1}{2}, \frac{2}{3}, 1\frac{1}{3}, 1\frac{2}{3}, 2$
- $\frac{1}{4}, \frac{1}{3}, \frac{2}{5}, \frac{2}{3}, \frac{4}{5}, 1$

D1.2: Ordering decimal tenths

- 2.4, 2.6, 2.8, 3.2, 2.1, 2.3, 2.5, 2.7
- 2, 2.3, 2.6, 2.9, 4, 4.2, 4.4, 4.6
- 1.3, 1.4, 1.9, 2.3, 2.7, 3.1
- 2.1, 2.3, 2.9, 3.2, 3.8, 4.3
- 2.1, 2.4, 4.2, 4.9, 5.3, 6.2
- 1.6, 9, 2.4, 10, 1.9
- 4.4, 12, 3

D1.3: Tenths and hundredths

- (a) sixty (b) seven tenths
- (a) zero tenths (b) eight hundredths
- (a) seven tenths (b) seven hundredths
- $\frac{40}{100} = \frac{4}{10}$ 5. $\frac{7}{10} = \frac{70}{100}$ 6. $\frac{9}{10} = \frac{90}{100}$

D1.4: Ordering decimal hundredths

- 6.02, 6.05, 6.08, 6.11
- 6.02, 6.04, 6.06, 6.08
- 8.05, 8.08, 8.11, 8.14
- 2.51, 2.53, 2.55, 2.57
- 1.4, 1.42, 1.45, 1.47, 1.5, 2.1
- 2.95, 3.16, 3.2, 3.23, 3.25, 3.5
- 1.34, 3.14, 3.15, 3.41, 3.43, 3.45
- 5.95, 9, 5.85

Worksheet 2: Addition

D2.1: Mental addition of simple decimals

- 0.6, 2, 1.5, 3, 1 or 1.0, 4, 2.6
- 1.9, 6, 3 or 3.0, 7, 2 or 2.0
- 6 or 6.0, 9, 9.9

D2.2: Standard written method of addition

- 3833, 2, 2709, 3, 7870

D2.3: Adding decimals

- 75.1, 2, 3.79, 3, 86.2, 4, 92.15
- 67.9, 6, 9.96, 7, 88.2, 8, 57.02

Worksheet 3: Subtraction

D4.1: Mental subtraction of simple decimals

- 0.2, 2, 0.4, 3, 3 or 3.0, 4, 0.5
- 0.2, 6, 1 or 1.0, 7, 1.2, 8, 1.2
- 4.4

D4.2: Standard written method of subtraction

- 135, 2, 326, 3, 546, 4, 437
- 517, 6, 292, 7, 306

D4.3: Subtracting decimals

- 2.1, 2, 2.2, 3, 4.27, 4, 3.09
- 1.8, 6, 5.52, 7, 2.8, 8, 2.68

ANSWERS

Worksheet 4: Multiplication

D4.1: Multiplication by stacking

- 231, 2, 342, 3, 175, 4, 581
- $\begin{array}{r} x3 \\ 3 \\ 90 \\ 600 \\ 690 \end{array}$
- $\begin{array}{r} x5 \\ 10 \\ 200 \\ 1500 \\ 1710 \end{array}$
- $\begin{array}{r} x7 \\ 35 \\ 490 \\ 700 \\ 1225 \end{array}$
- 645, 2, 972, 3, 2735, 4, 4938
- 2058

D4.2: Multiplication

- 645, 2, 972, 3, 2735, 4, 4938
- 2058

D4.3: Multiplying decimals

- £9.60, 2, £16.20, 3, £24.50, 4, 36.8 m
- 31.8, 6, £48, 7, £42.60, 8, 43.4 m
- £43, 10, 14.7 m

Worksheet 5: Ratio and proportion

D5.1: Ratio

- In every 6 squares, 2 are black
In every 12 squares, 4 are black
In every 9 squares, 3 are black
In every 30 squares, 10 are black

	Black	White
1.	1	2
2.	2	4
3.	3	6
4.	4	8
5.	5	10
6.	7	14
7.	10	20

D5.2: Ratio and the words that go with it

- 15, 20, 30, 50

	Green	Yellow	Total
1.	1	3	4
2.	2	6	8
3.	3	9	12
4.	5	15	20
5.	7	21	28

For every green bead there are 3 yellow beads.

The number of green beads is one third the number of yellow beads.

The ratio of green beads to yellow beads is 1 to 3

D5.3: Equivalent ratios

- 1) 1:2, 2) 1:5, 3) 3:2, 4) 1:4
- 5) 2:5, 6) (a) 4:1, (b) 1:4
- 7) (a) 4, (b) 25

D5.4: One for every... and totals

	Red	Blue	Total
1.	1	2	3
2.	2	4	6
3.	10	20	30
4.	15	30	45
5.	20	40	60

- (a) Number of blue beads = double the number of red beads
(b) Number of red beads = half the number of blue beads

	Red	Blue	Total
1.	1	2	3
2.	2	4	6
3.	3	6	9
4.	5	10	15
5.	8	16	24

Worksheet 6: Simple sequences

D6.1: Counting on and back in small steps

- 13, 16, 19, 22, 25, 28, 31
- 61, 64, 67, 70, 73, 76, 79
- 59, 64, 69, 74, 79, 84, 89, 94
- 81, 85, 89, 93, 97, 101, 105, 109
- 64, 67, 70, 73, 76, 79, 82, add 3
- 29, 24, 19, 14, 9, 4, -1: subtract 5
- 90, 87, 84, 81, 78, 75, 72: subtract 3

D6.2: Counting on and back in 6s

- 24, 30, 36, 42, 48, 54, 60, 66, 72
- 39, 45, 51, 57, 63, 69, 75, 81, 87
- 62, 68, 74, 80, 86, 92, 98, 104, 110, 116
- 8, 14, 20, 26, 32, 38, 44, 50, 56, 62
- 52, 58, 64, 70, 76, 82, 88, 94, 100
- 15, -9, -3, 3, 9, 15
- 40, 34, 28, 22, 16, 10, 4
- 8, 2, -4, -10, -16, -22, -28
- 7, -13, -19, -25, -31, -37, -43
- 12, -18, -24, -30, -36, -42, -48

D6.3: Counting on and back in 9s

- 27, 36, 45, 54, 63, 72, 81, 90, 99
- 48, 57, 66, 75, 84, 93, 102, 111, 120, 129
- 74, 83, 92, 101, 110, 119, 128, 137, 146
- 9, 0, 9, 18, 27, 36, 45, 54
- 33, 42, 51, 60, 69, 78, 87, 96
- 24, -15, -6, 3, 12, 21, 30, 39

- 32, 23, 14, 5, -4, -13
- 3, -12, -21, -30, -39, -48, -57, -66
- 18, -27, -36, -45, -54, -63, -70
- 82, 73, 64, 55, 46, 37, 28

D6.4: Rules for counting on and counting back

- 20, 28, 36, 44, 52, 60, 68, 76
- 19, 16, 23, 30, 37, 44, 51, 58: add 7
- 33, 39, 45, 51, 57, 63, 69, 75: add 6
- 56, 47, 38, 29, 20, 11, 2
- 54, 46, 38, 30, 22, 14, 6: subtract 8
- 14, -8, -2, 4, 10, 16, 22, 28: add 6
- 40, 51, 62, 73, 84, 95, 106, 117: add 11
- 7, -1, 5, 11, 17, 23, 29, 35: add 6
- 42, 51, 60, 69, 78, 87, 96: add 9
- 125, 150, 175, 200, 225, 250, 300: add 25

Worksheet 7: Brackets

D7.1: Using brackets

- 32, 2, 50, 3, 26, 4, 16
- 18, 6, 10, 7, 9, 8, 6
- 4

D7.2: Brackets and letters

- b=5, 2, c=2, 3, d=5, 4, e=5
- f=7, 6, g=5, 7, h=21, 8, i=15
- j=2

Worksheet 8: Surface areas

D8.1: Introducing surface area

- (a) 6 (b) 1 cm² (c) 6 cm²
- 24 cm²

- A: 24, B: 20, C: 40, D: 58
- E: 58, F: 50

D8.2: Surface areas of cuboids

- 62 cm², 2, 122 cm²