

# Grade 7 Resources

from



**Mathematics Workshop**

**“It’s not too late  
– Quality lessons to help with exam review”**

**March 2003**

**Prepared by**

**David Ritchie**

## **Introduction**

The materials contained in this package are designed to support review for exams.

The materials model the process of completing an item analysis of the Mathematics Progress Indicator Test and developing lessons to help the students learn the key concepts of the questions.

## **Using the materials**

### *Step 1*

**Analyse your class results** from Form 1 and Form 2 of the Mathematics Progress Indicator. Use **pages 4 and 5**.

### *Step 2*

Develop lessons that address student misunderstandings.

This means developing reteaching lesson on mis-understood concepts not just going over more exam questions.

**Sample lessons** have been provided from **page 6 onwards**.

## **Developing student Exam Strategies**

Remember to model exam strategies as you review for the exam. Get a copy of **[“Math Exam Strategies Overview”](#)**

## **PD Workshops related to these materials**

The materials were presented to the District 8 Math Consortium Workshop.

Resources materials from this workshop for Grade 6, 7 and 8 are currently available for download from **[www.mathsnet.vic.edu.au/nyc/](http://www.mathsnet.vic.edu.au/nyc/)**

## Interpreting and Analysing the Mathematics Progress Indicator Results

### A Process

1. Review the success of your students by looking for the questions in which the students performed poorly.
2. Order these questions from poor performance to good performance
3. Analyse the math behind the question
4. Determine a solution or lesson strategy to help improve student performance.

Class:

Level: E

Form: 1

Ranking Poor to Good	Question No.	Math behind the question	Solution or lesson strategies
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

If necessary, add another page.

# Interpreting and Analysing the Mathematics Progress Indicator Results

## A Process

1. Review the success of your students by looking for the questions in which the students performed poorly.
2. Order these questions from poor performance to good performance
3. Analyse the math behind the question
4. Determine a solution or lesson strategy to help improve student performance.

Class:

Level: E

Form: 2

Ranking Poor to Good	Question No.	Math behind the question	Solution or lesson strategies
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

If necessary, add another page.

## Sample Interpretation and Analysis of Mathematics Progress Indicator Results - Level E, Form 1

Ranking	Level E Form 1		
Poor to Good	Question No. less than 40%	Math behind the question	Solution or lesson strategies
1	47	volume stacking	Have they done it?
2	30	scale	Have they done it?
3	12	add zeros	
4	41	area triangle	Have they done it?
5	27 *	circumference	Have they done it?
6	25 *	percentage	underlying concept, part out of 100
7	33 *	perimeter	construction, large version and make students walk around the shape
8	37	draw diagram	make
9	7	distributive law	
10	35 *	algebra or non-algebra approach	Table
11	42	mean	line diagram, "Data about Us"
12	34 *	angle estimation	clock angles
13	46		
14	50		
15	32		
16	45		
17	26		
18	28		
19	8		
20	40		
21	49		
22	6		
23	13		
24	23		
25	39		

## Sample Interpretation and Analysis of Mathematics Progress Indicator Results - Level E, Form 2

Ranking	Level E Form 2		
Poor to Good	Question No. less than 40%	Math behind the question	Solution or lesson strategies
1	45 *	Ratio/Decimal/Proportion	Alternate approach, common sense sentences
2	11 *	Percentage estimation	Use 10% approach
3	14	Survey sample	
4	50	Diagram draw	
5	15 *	Algebraic proportion	Table of values - guess and check
6	37 *	Percentage equivalent	30% is 540
7	46 *	Tricky	Do similar question. Make, cut and past
8	49 *	Scale	Have they done it? Similar to Grade 8 maps
9	6	Pounds	Did it put them off?
10	29	Area, fractions	Have they done it?
11	39 *	Graph shape on grid	Have the done it?
12	44	Best. Tricky	
13	34	Forming algebraic expression	
14	38	Volume to capacity	Have they done it?
15	26	% higher	
16	33	2 steps/mean/above mean	Have they done it? "Data about us"
17	42	Graph	
18	28 *	scientific notation	Do student understand or just trying to remember the rule
19	8		
20	10		
21	48		
22	13		
23	30		
24	25		
25	17		

## Computation and Numerical Estimation – Review 7-1-22 Teacher Notes

### **Question 22, Level E, Form 1**

A farmer has harvested 2,000 pounds of apples. He is packaging them in bags each containing  $3\frac{1}{2}$  pounds of apples. How many of these bags can he fill?

**F** Between 500 and 550

**G** Between 550 and 600

**H** Between 600 and 650

**J** Between 650 and 700

### **Traditional Approach**

The traditional approach is to set up a proportion and solve. For some students this is still a mystery especially the setting up of the proportion.

### **Alternative Approach**

An alternative approach is to work with an equivalence table. This uses number sense and is achievable for many students. See the example below

Pounds	Bags
$3\frac{1}{2}$ OR 3.5	1
35	10
350	100
700	200
1400	400
2100	600
105	30
1995	570

*Your explanation of what the student is doing*

# Computation and Numerical Estimation – Review 7-1-22

## Student Activity

### ***What you have to do!***

1. Read the following question
2. Review the working done by one student
3. Explain to the right hand side of their working what they are doing?
4. Complete the follow-up task

### ***Read and analyse the question***

A farmer has harvested 2,000 pounds of apples. He is packaging them in bags each containing  $3\frac{1}{2}$  pounds of apples. How many of these bags can he fill?

- F Between 500 and 550  
G Between 550 and 600  
H Between 600 and 650  
J Between 650 and 700

### ***Review the student sample answer***

Pounds	Bags
$3\frac{1}{2}$ OR 3.5	1
35	10
350	100
700	200
1400	400
2100	600
105	30
1995	570

*Your explanation of what the student is doing*

So the answer is \_\_\_\_\_

### **Follow-up task**

1. Write your own question like the one above
2. Complete the working like the student sample answer (do it over the page)
3. Explain what you are doing. (next to or under your working)



# Number and Number Relations Review 7-1-25 Teacher Notes

## Question 25, Level E, Form 1

Ryan marked an X on each day that it rained in April

April						
S	M	T	W	TH	F	S
<del>1</del>	2	<del>3</del>	4	5	6	7
8	9	10	<del>11</del>	12	13	<del>14</del>
<del>15</del>	<del>16</del>	<del>17</del>	18	19	20	<del>21</del>
<del>22</del>	23	24	25	26	<del>27</del>	<del>28</del>
<del>29</del>	30					

On what percent of the days in April did it rain?

- F. 12%
- G. 25%
- H. 36%
- J. 40%

### Fundamental Concepts

Percent (%) means out of (every) 100.

### Traditional and Alternative Approaches

- There are many approaches to solving this question. (See Percentage Study Sheet and Study Help).
- I believe the simplest approach is create the fraction that compare the 2 quantities and to realise that the denominator has to be out of 100, and work towards this goal. **REMEMBER:** An approximation is often all that is needed to make correct multiple choice selection.
- Many students with some coaching can follow this process, whereas the because confused by the 3 step required in the proportion method.

$$\frac{\text{Days of rain}}{\text{Days in Month}} = \frac{12}{30} \quad \text{Is the same as} \quad \frac{4}{10} \quad \text{Which is} \quad \frac{40}{100}$$

OR I like it better doing it as sentences

Get to 10 then 100	Get to a factor of 100 then 100	Get near 100
12 out of 30 divide by 3 4 out of 10 multiply by 4 40 out of 100 so 40%	12 out of 16 divide by 4 3 out of 4 multiply by 25 75 out of 100 so 75%	23 out of 42 divide by 4 6 out of 10 multiply by 10 60 out of 100 so about 60%

If you just plan to review the question also try the approach on the following 2 pages, Number and Number Relations Review 7-1-25 Student Activity

# Number and Number Relations Review 7-1-25

## Student Activity

### ***What you have to do!***

1. Read the following question
2. Review the working done by three different students
3. Explain to the right hand side of their working what they are doing?
4. Complete the follow-up task

### ***Read and analyse the question***

***Ryan marked an X on each day that it rained in April***

April						
S	M	T	W	TH	F	S
<del>1</del>	2	<del>3</del>	4	5	6	7
8	9	10	<del>11</del>	12	13	<del>14</del>
<del>15</del>	<del>16</del>	<del>17</del>	18	19	20	<del>21</del>
<del>22</del>	23	24	25	26	<del>27</del>	<del>28</del>
<del>29</del>	30					

On what percent of the days in April did it rain?

- F. 12%
- G. 25%
- H. 36%
- J. 40%

### ***Fundamental Concepts***

Percent (%) means out of (every) 100.

### ***Review Student 1's answer***

*Explain below the working what the student did*

$\frac{\text{Days of rain}}{\text{Days in Month}} = \frac{12}{30}$ 
                    
 Is the same as
                    
  $\frac{4}{10}$ 
                    
 Which is
                    
  $\frac{40}{100}$

*So the answer is 40%*

**Review Student 2's answer.**

*Explain below the working what the student did*

$$\frac{12}{30} \times \frac{100}{1} = \frac{1200}{30} = 40\%$$

*So the answer is 40%*

**Review Student 3's answer**

*Explain beside the working what the student did?*

$$\frac{12}{30} = \frac{x}{100}$$

$$30x = 1200$$

$$\frac{30x}{30} = \frac{1200}{30}$$

$$x = 40$$

So the answer is 40%

**Follow-up task**

1. Write your own question like the one above
2. Do the question like one of the student sample answers. (do it over the page)
3. Explain what you are doing. (next to or under your working)

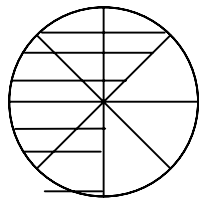
# Percentages

# Study Sheet

1. Which of these is the best estimate of 12% of 50.34?

- A. 4
- B. 6
- C. 8
- D. 10

2. The circle below is divided into 8 equal sections



Which of these numbers does not name the portion of the circle that is shaded?

- A.  $\frac{5}{8}$
- B.  $\frac{10}{16}$
- C. 62.5%
- D. 0.0625

3. Mr Winner invested \$1800. The stock market went down and he lost \$900. Then it went back up and he regained \$300. What percent of his original investment does Mr Winner have now?

- A. 25%
- B.  $33\frac{1}{3}\%$
- C. 50%
- D.  $66\frac{2}{3}\%$

4. Which of these is the best estimate of 7.5% of 163.8?

- A. 4
- B. 12
- C. 40
- D. 120

5. Brian marked a X on each day that it rained in April.

April						
S	M	T	W	TH	F	S
<del>1</del>	2	<del>3</del>	4	5	6	7
8	9	10	11	12	13	14
<del>15</del>	<del>16</del>	<del>17</del>	18	19	20	21
<del>22</del>	23	24	25	26	27	28
29	30					

On what percent of the days in April did it rain?

- A. 6%
- B. 12%
- C. 20%
- D. 60%

6. Sales of Pottery went from \$400 per day to \$500 per day. The sale of pottery was mostly likely to have been about

- A. 15% higher
- B. 25% higher
- C. 40% higher
- D. 50% higher

# Percentages

# Study Help

## Reading the question

Underline or circle the key (important) words. If you wish cross out the unnecessary words

Look for the words related to accuracy: nearest unit, nearest tenth.

Be careful of the words "best estimate". This normally means there is one answer that is better than the rest.

## Basic Facts -Remember common percentage, fraction and decimal equivalents.

Percentage	Fraction out of 100 and reduced	Decimal
25%		
50%		
75%		
10%		
20%		
5%		
1%		

### 5 Ways of doing question Type 1 - Find 12 as a percentage of 30

Equivalent Fractions $\frac{12}{30} = \frac{4}{10} = \frac{40}{100}$ so 40%	Fraction of 100 $\frac{12}{30} \times 100 = \frac{1200}{30} = 40\%$	As a proportion $\frac{12}{30} = \frac{x}{100}$ cross-product $30x = 1200$ $x = 40$
Convert to a decimal $\frac{12}{30} = 0.40$ 0.40 so 40%	By 1 <sup>st</sup> Principles - Using words 12 out of 30 (divided by 3) 4 out of 10 (multiply by 10) 40 out of 100 so 40%	

### 6 Ways of doing question Type 2 - Find 37% of \$250

Equivalent Fractions $\frac{37}{100} \times 2.5 = \frac{92.50}{250}$	Using Fractions $\frac{37}{100} \times 250 = \frac{9250}{100} = \$92.50$	As a proportion $\frac{37}{100} = \frac{D}{250}$ cross-product $100D = 37 \times 250$ $100D = 9250$ (divided by 100) $x = \$92.50$																														
Using Decimals $0.37 \times \$250 = \$92.50$	By using 100% as a building block <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>%</th> <th>\$</th> </tr> </thead> <tbody> <tr> <td>100%</td> <td>\$250.00</td> </tr> <tr> <td>10%</td> <td>\$25.00</td> </tr> <tr> <td>20%</td> <td>\$50.00</td> </tr> <tr> <td>5%</td> <td>12.50</td> </tr> <tr> <td>1%</td> <td>\$2.50</td> </tr> <tr> <td>1%</td> <td>\$2.50</td> </tr> <tr> <td>Total: 37%</td> <td>\$92.50</td> </tr> </tbody> </table>	%	\$	100%	\$250.00	10%	\$25.00	20%	\$50.00	5%	12.50	1%	\$2.50	1%	\$2.50	Total: 37%	\$92.50	By 1 <sup>st</sup> Principles using \$100 as a building block <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>\$</th> <th>37% of \$</th> </tr> </thead> <tbody> <tr> <td>\$100</td> <td>\$37.00</td> </tr> <tr> <td>\$100</td> <td>\$37.00</td> </tr> <tr> <td>\$50</td> <td>\$15.00</td> </tr> <tr> <td></td> <td>3.50</td> </tr> <tr> <td></td> <td></td> </tr> <tr> <td>\$250</td> <td>\$92.50</td> </tr> </tbody> </table>	\$	37% of \$	\$100	\$37.00	\$100	\$37.00	\$50	\$15.00		3.50			\$250	\$92.50
%	\$																															
100%	\$250.00																															
10%	\$25.00																															
20%	\$50.00																															
5%	12.50																															
1%	\$2.50																															
1%	\$2.50																															
Total: 37%	\$92.50																															
\$	37% of \$																															
\$100	\$37.00																															
\$100	\$37.00																															
\$50	\$15.00																															
	3.50																															
\$250	\$92.50																															

## Measurement – Review 7-1-27

### Question 27, Level E, Form 1

The diameter of a truck tire is 120 centimeters. To the nearest centimeter, how far does the tire travel in one complete revolution? ( $C = \pi d$ )



A	60 centimeters
B	188 centimeters
C	240 centimeters
D	377 centimeters

### Reading the Question – Key Word

Diameter – 120 cm

**Nearest** centimeter (indicates an estimate may be suitable)

One revolution (that is the circumference)

### The Fundamental Concept

Circumference is the distance around the outside of a shape, and that is the distance the wheel travels in 1 revolution.

Formula is  $C = \pi d$  ( $\pi = 3.14$ ),

**OR** be still

There are approximately 3 diameters in a circumference, that is  $C \cong 3d$

So using an approximation  $C \cong 3(d) \cong 3(120) \cong 360$

As 360 is an underestimation the answer is D or 377 centimeters.

### Further Practice

Find the approximate circumference of a circle with:

1. Diameter = 10 in
2. Diameter = 30 cm
3. Radius = 20 cm
4. Radius = 150 cm

Find the approximate diameter of a circle with:

5. Circumference = 60 cm
6. Circumference = 300 cm
7. Circumference = 40 inches
8. Circumference = 2 ft

### Follow-up task

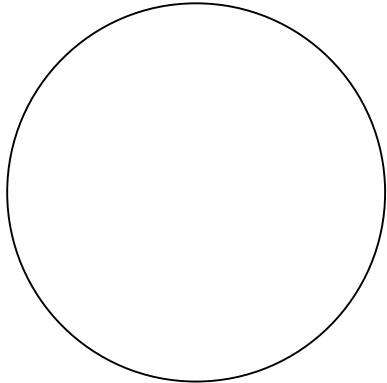
1. Write your own question like the one above
2. Explain what you are doing. (next to or under your working)

# Measuring Around Circles

# Study Sheet



Use your centimeter rule to help solve the problem.



To the nearest tenth of a centimeter, what is the circumference of this circle?  
( $C = \pi d$ )

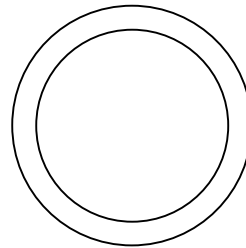
- A. 7.9 centimeters
- B. 15.7 centimeters
- C. 19.6 centimeters
- D. 31.4 centimeters

- 2 The diameter of a car tire is 70 centimeters. To the nearest centimeter, how far does the tire travel in one complete revolution?  
( $C = \pi d$ )



- A. 35 centimeters
- B. 110 centimeters
- C. 140 centimeters
- D. 220 centimeters

- 3 Sasha skated a circle on the ice, keeping her skates 1 foot apart. The diagram shows the double circle she made. If the radius of the inner circle is 20 feet, what is the approximate circumference of the outer circle?  
( $C = \pi d$ )



- A. 66 feet
- B. 69 feet
- C. 126 feet
- D. 132 feet

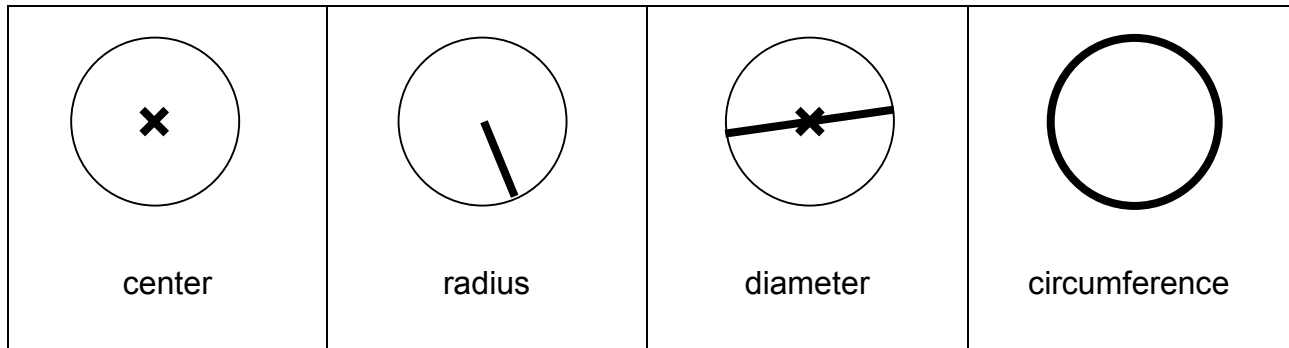
- 4 To store the string for a kite, Joshua wraps it around a soda bottle that has a radius of  $2\frac{1}{2}$  inches. One day when rolling up the kite string, Joshua counts that he does 100 turns to put the string on the bottle. What is the approximate length of the string?  
( $C = \pi d$ )

- A. 65 feet
- B. 130 feet
- C. 163 feet
- D. 654 feet

# Measuring Around Circles

## Study Help

### Parts of Circle



### Diagrams

If there is no diagram, **draw one**.

On the diagram, **draw** the **parts** and **label** their **sizes**.

### Reading the question

Underline or circle the key (important) words. If you wish cross out the unnecessary words



Means use your *ruler to measure*. Use the correct units.

Look for the words: **circumference**, **radius**, **diameter**.

If they are asking you to find the circumference **are you given** the **radius** or the **diameter**?

If given the radius remember to multiply by 2 to find the diameter, before calculating the circumference. This is the most common error.

Read carefully the **units**, inches, centimeters etc.

Read carefully the **degree of accuracy**, for example the nearest whole unit.

### Using the correct formulae

$C = \pi d$  is usually given

Remember  $\pi = 3.14$  or about 3.

Substitute your information.

Calculate the answer.

**NOTE:** You can estimate your circumference by doing  $3 \times d$ . This is often good enough for completing multiple-choice questions.

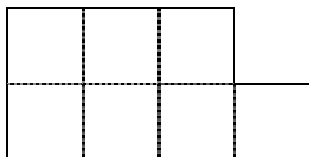
**BE CAREFUL:** you could also use  $C = 2\pi r$ . **DO NOT** use  $A = \pi r^2$



## Measurement – Review 7-1-33 Teacher Notes

### **Question 33, Level E, Form 1**

The figure below represents a concrete patio. The patio is composed of 7 squares, each with a perimeter of 8 meters.



What is the perimeter of the entire patio?

<b>A</b>	12 meters
<b>B</b>	24 meters
<b>C</b>	28 meters
<b>D</b>	56 meters

### **Reteaching Approaches**

**There are several great ways to approach review for this type of question.**

Here are some ideas:

1. Use tape to mark out a similar problem on the floor tiles
2. Make large squares from construct card and make the design on the floor or use two-sided tape to display on the chalkboard.
3. Get the students to construct the design on inch dot paper.

**It is important to act out the problem by making a model of this type of situation, as this is far more powerful than just drawing a diagram and just talking about the question.**

If you just plan to review the question try the approach on the following 2 pages, “Measurement – Review 7-1-33 – Student Activity”

## Measurement – Review 7-1-33

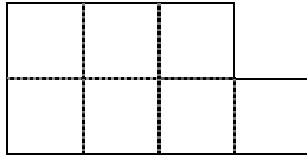
### Student Activity

#### **What you have to do!**

1. Read the following question
2. Review the working done by three different students
3. Explain to the right hand side of their working what they are doing?
4. Complete the follow-up task

#### **Read and analyse the question**

The figure below represents a concrete patio. The patio is composed of 7 squares, each with a perimeter of 8 meters.



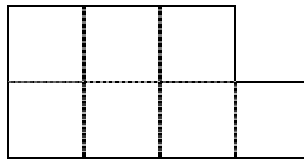
What is the perimeter of the entire patio?

- |          |           |
|----------|-----------|
| <b>A</b> | 12 meters |
| <b>B</b> | 24 meters |
| <b>C</b> | 28 meters |
| <b>D</b> | 56 meters |

#### **The Fundamental Concept**

Perimeter is the distance around the outside of a shape

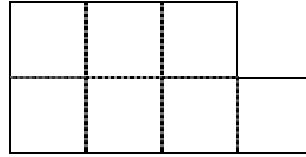
#### **Review Student 1's answer**



The answer is  $7 \times 8$  or 56 meters.  
So the answer is D.

*Explain what the student did?*

**Review Student 2's answer**

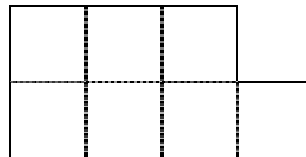


Perimeter is around the outside you get 12.

So the answer is A.

*Explain what the student did?*

**Review Student 3's answer**



Perimeter is around the outside you get 24.

So the answer is B.

*Explain what the student did?*

**Follow-up task**

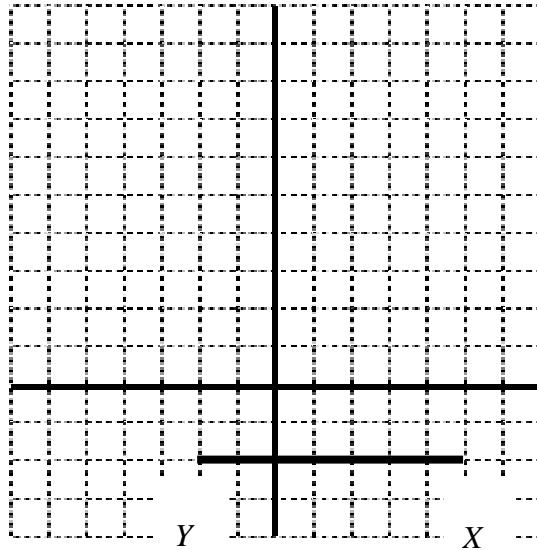
1. Write your own question like the one above
2. Do the question like one of the student sample answers. (do it over the page)
3. Explain what you are doing. (next to or under your working)

## Geometry and Spatial Sense – Review 7-1-34

### Question 34, Level E, Form 1

Use the protractor to help you solve this problem.

Points X (-2, -2) and Y (5, -2) are shown on the coordinate grid below. Point Z is **not** shown. (Scale in the grid is 1 square is 1 unit)



If  $\angle XYZ$  measures about  $41^\circ$ , which of these could be the coordinates of Point Z?

F (5,0)

G (5,2)

H (5,4)

J (5,6)

### Fundamental Concepts

An angle is a measure of turn

When using a protractor start reading the scale from zero (0).

### A non-protractor approach

It is possible to do this question without a protractor.

If you make an angle of  $45^\circ$ , which most students know is half of  $90^\circ$ , you can draw a line at  $45^\circ$ .

As  $41^\circ$  is less than  $45^\circ$ , the only possible point is (5,4)

### Further activities

Clock fractions (Speak to your A.U.S.S.I.E. Math Consultant)

Estimating angles (using clock fractions)

### Follow-up task

1. Write your own question like the one above
2. Explain what you are doing. (next to or under your working)

## Patterns, Functions, Algebra – Review 7-1-35 – Teacher Notes

### Question 35, Level E, Form 1

The field hockey team at a middle school has 12 more players than the softball team. The two teams have a total of 80 players. How many players are there on the softball team?

<b>A</b>	28
<b>B</b>	34
<b>C</b>	52
<b>D</b>	68

### Traditional Approach

Many teachers model an algebraic approach to this type of question.

Many students given some coaching can develop good skills in doing “Guess and Check”

As a teacher you should model for the students how to organize their information in a table of values.

### Alternative Approaches

#### Approach 1 – split the players equally and then “Test and Review”

Field hockey	Softball	Thoughts
40	40	Split equally. Hockey need more
50	30	Hockey has 20 more (too much)
45	35	Hockey only has 10 more (needs be to 2 more)
47	33	Hockey has 14 more (too much)
46	34	Hockey has 12 and total players is 80

#### Approach 2 – take the excess of the total and divide the remaining players equally.

Field hockey	Softball	Thoughts
12 more than softball		Total of 80
		If hockey has 12 more than, each share $80 - 12$ that is 68
34	34	Each have half of 68
46	34	Total for each team

### Similar Questions

Continental Press Form 1, 2 and 3 of Mathematics Progress Indicator Levels D, E, F. (Level F, Form 1, Qu 44)

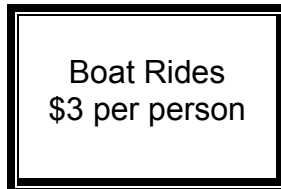
### Follow-up task

1. Write your own question like the one above
2. Explain what you are doing. (next to or under your working)

## Other Questions

### Question 46, Level D, Form 2

Use this sign to answer the questions below.



The members of the bird-watching club took the boat to an island. They paid \$192 all together for the boat ride. If there are 6 more women than men in the group, how many women are there?

F	35
G	38
H	70
J	99

### Question 15, Level E, Form 2

Mrs Snyder owns a car wash.

The car wash offers a choice of Regular Wash or Deluxe Wash. One day there was a total of 110 customers. The number of customers who chose Regular Wash was 24 more than the number who chose Deluxe Wash. How many customers chose Regular Wash that day?

A	67
B	71
C	79
D	86

### Question 44, Level F, Form 1

A total of 1,060 people attended two performances of the school play. At the first performance there were 120 more people than at the second performance. How many people attended the first performance?

F	470
G	590
H	650
J	940

## Computation and Numerical Estimation – Review 7-2-11

<b>Question 11, Level E, Form 2</b>	
Which is the best estimate of $2.5\% \times 163.8$ ?	
<b>A</b>	4
<b>B</b>	8
<b>C</b>	18
<b>D</b>	40

### **Reading the Question – Key Word**

best estimate

### **Fundamental Concepts**

Percent (%) means out of (every) 100.

### **Traditional and Alternative Approaches**

- There are many approaches to solving this question. (See Percentage Study Sheet and Study Help).
- Using **benchmarks** and **estimation** results is a quicker process for solving this problem.

### **Some approaches**

Think 25% of 160 = 40

Then 2.5% is 25% divided by 10, so answer is 40 divided by 10 = 4

Think 10% of 160 = 16

Then 2.5% is 10% divided by 4, so the answer is 16 divided by 4 = 4

Think 1% of 160 = 1.6

Then 2.5% is 1% + 1% + 0.5%, so the answer is 1.6 + 1.6 + 0.8 = 4

### **Benchmarks**

If students develop skills in the use of 100%, 10% and 1% benchmarks they can complete most percentage problems. This method eliminates the rules of moving decimal points as taught in many classrooms.

### **Further Practice**

Do similar questions.

Percentage Study Sheet and Study Help

### **Follow-up task**

1. Write your own question like the one above
2. Explain what you are doing. (next to or under your working).

# Percentages – Using 100% as a Building Block

## Teacher Notes

The method is based on the foundation concept that

**100% means you have the total amount, the whole thing.**

This method can be completed with a “stick in the sand” there is no need for a fancy calculator.

Students need to be able to add up and multiply and divide by 2, 5 and 10.

This method uses a table.

1. In the 1<sup>st</sup> column you record the %;
2. In the 2nd column you record the \$;
3. The first three entries are for 100%, 10% and 1% to form the building blocks for other percentages.

Example 1: Find 37% of \$250

In the 1st column you record the %.

%	\$
100%	\$250.00
10%	\$25.00
1%	\$2.50
10%	\$25.00
10%	\$25.00
10%	\$25.00
5%	\$10.00
1%	\$2.50
1%	\$2.50
<b>Total %</b>	<b>Total \$</b>
37%	\$92.50

In the 2nd column you record the \$.

The first three entries are for 100%, 10% and 1% to form the building blocks for other percentages.

Students will develop their own methods. Some will do 10%, 10%, 10%, some will do 30%, some will do 20% ,10%.



Name:

Date:

## Percentages – Using 100% as a Building Block

Aim: How can we using 100% as a Building Block to solve percentage problems?

NYS Standard:

NYC Standard:

Do now:

1)  $270.00 \div 10$

2)  $270 \div 100$

3)  $270.00 \div 2$

4)  $573.00 \div 10$

5)  $573.00 \div 2$

6)  $57.30 \div 2$

Notes:

The method is based on the foundation concept that

**100% means you have the total amount, the whole thing.**

Example 1: Find 38% of \$270

%	\$
100%	\$270.00
10%	\$27.00
1%	\$2.70
100%	\$270.00
100%	\$270.00
50%	\$100.00
	\$35.00
10%	\$27.00
10%	\$27.00
Total %	Total \$
37%	\$92.50

This method uses a table.

1. In the 1<sup>st</sup> column you record the %;
2. In the 2nd column you record the \$;
3. The first three entries are for 100%, 10% and 1% to form the building blocks for other percentages.

Example 2: Find 26% of \$573

%	\$
100%	\$573.00
10%	\$57.30
1%	\$5.73
Total %	Total \$

Name:

Date:

### Finding a Percentage by using 100%, 10% and 1% building blocks.

#### Question 1

Find 35 % of \$52

%	\$
100%	<b>\$52.00</b>
10%	
1%	
20%	
10%	
5%	
Total 35%	Total

#### Question 2

Find 28% of \$164

%	\$
100%	
10%	
1%	
20%	
5%	
2%	
1%	
Total	Total

#### Question 3

Find 47% of \$287

%	\$
100%	
10%	
1%	
Total	Total

Reminder: Work out 100%, 10% and 1%. Use these as the building blocks for further calculations.

Question 4  
Find 83 % of \$350

%	\$
100%	
10%	
1%	
Total	Total

Question 5  
Find 72.5% of \$320

%	\$
100%	
10%	
1%	
Total	Total

Question 6  
Find 126% of \$170

%	\$
100%	
10%	
1%	
100%	
20%	
?	
?	
?	
Total	Total

## Patterns Functions Algebra – Review 7-2-37

<b>Question 37, Level E, Form 2</b>	
During a storm, 540 homes in a small town lost their electricity. If this was 30% of the homes in the town, what was the total number of homes in the town?	
<b>A</b>	162
<b>B</b>	570
<b>C</b>	1,620
<b>D</b>	1,800

### **Reading the Question – Key Word**

540 homes

This was 30%

What was the total number of homes?

### **Fundamental Concepts**

Percent (%) means out of (every) 100.

### **Traditional Approach**

The traditional approach is the set up a proportion and solve. For some students this is still a mystery especially the setting up of the proportion.

### **Alternative Approach**

I like it better doing it as sentences similar to a table of equivalences, using the idea of benchmarks that can be converted into 100.

30% is 540  
 divide by 3  
 10% is 180  
 multiply by 100  
 100% is 1800  
 so the answer is 1800

### **Other examples**

Get to 10 then 100	Get to a factor of 100 then 100	Get near 100
12 out of 30 <i>divide by 3</i> 4 out of 10 <i>multiply by 4</i> 40 out of 100 so 40%	12 out of 16 <i>divide by 4</i> 3 out of 4 <i>multiply by 25</i> 75 out of 100 so 75%	23 out of 42 <i>divide by 4</i> 6 out of 10 <i>multiply by 10</i> 60 out of 100 so about 60%

**REMEMBER:** An approximation is often all that is needed to make correct multiple choice selection.

### **Follow-up task**

1. Write your own question like the one above
2. Explain what you are doing. (next to or under your working).

## Measurement – Review 7-2-46

### Question 46, Level E, Form 2

The rectangle below has a perimeter of 85 centimeters.



If a 5-centimeter square is cut from each corner of the rectangle as shown, what will be the perimeter of the resulting figure?

**F** 85 centimeters

**G** 95 centimeters

**H** 105 centimeters

**J** 125 centimeters

### ***The Fundamental Concept***

Perimeter is the distance around the outside of a shape

### ***The Trap***

The Perimeter does not change. To help work this out write on the diagram or draw a separate diagram and calculate the perimeter.

### ***Approaches to improve student understanding***

**There are several great ways to approach review for this type of question.**

Here are some ideas:

1. Use tape to mark out a similar problem on the floor tiles
2. Make large squares from construct card and make the design on the floor or use two-sided tape to display on the chalkboard.
3. Get the students to construct the design on inch dot paper.

**It is important to act out the problem by making a model of this type of situation, as this is far more powerful than just drawing a diagram and just talking about the question.**

### ***Follow-up task***

1. Write your own question like the one above
2. Explain what you are doing. (next to or under your working)