Striving To Improve

PHOTOCOPY MASTERS

Integers

For students aged 11 - 15 years who are underachieving at their year level.

Ready-Ed Publications

Edited by Mirella Trimboli

Contents

Teachers' Notes

This resource is focused on the Number and Algebra Strand of the Australian Curriculum for lower ability students and those who need further opportunity to consolidate these core areas in Mathematics.

Each section provides students with the opportunity to consolidate written and mental methods of calculation, with an emphasis on process and understanding.

The section entitled *Understanding Integers* enables students to re-encounter ideas of place value, rounding, estimation, factors, multiples and the concept of a directed number. These activities are a useful way to scaffold a new unit of Mathematics and will help build confidence for lower ability students to attempt more challenging problems at their year level.

The section entitled *Calculating With Integers* walks students through the four core calculations. The activities are designed to guide student learning with minimal input from the teacher and there is a strong emphasis on process and understanding. Students explore addition and subtraction with two and three digit sums and can apply what they have learned to some real life application problems. Similarly, students explore the various levels of multiplication and division before applying them to a variety of applications.

The activities can be used for individual students needing further consolidation in a mainstream classroom or as instructional worksheets for a whole class of lower ability students. The activities are tied to Curriculum Links in the Australian Curriculum ranging from grade levels of Year 4 through to Year 6 and are appropriate for students requiring extra support in Years 7, 8 and 9.

It is hoped that *Integers* will be used to help teachers provide appropriate resources and support to those students in greatest need. The book as a whole can be used as a programme of work for those students on a Modified Course or Independent Learning Programme. Activities are sufficiently guided so that students can work independently and at their own pace without constant supervision and guidance from the teacher.

Understanding Integers

The activities in this section allow students to revise many of the core Number properties and ideas. Before introducing lower ability students to new work on Integers, these activities will encourage students to consolidate concepts from previous years.

The concepts covered include:

Place Value
Students have the opportunity to explore what they know about place value for integers and to understand the composition and relative magnitude of numbers. These activities are particularly useful before moving on to calculations and work with numbers involving decimals.

Rounding
As a concept with which many students experience difficulty, it is important to allow for a thorough consolidation of rounding integers to specified place values. This is important work to include prior to work on rounding decimals, working with scientific notation and significant figures.

Estimation
To assist students with building their appreciation and understanding of working with numbers, estimation is a core skill. These activities will encourage students to reflect on whether their calculations are providing reasonable solutions.

Factors and Multiples
As a precursor to working on patterns and number theory, students need to have a strong grasp of the factors and multiples that compose a number. These activities allow students to revise these concepts.

Directed Numbers
As the majority of work on Directed Numbers is taught in Lower Secondary, these activities allow students to understand, through real life applications, the contexts for negative integers.

❂ Place Value 1

- If the number is <u>whole</u>, then the last digit on the right is in the <u>ones</u> column.
  Digit value tells you how much a digit is worth in a number.
  Look at the digits in the number **1 234 589** below:

Example

	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
Digit	**1**	**2**	**3**	**4**	**5**	**8**	**9**
Value	1 000 000	200 000	30 000	4 000	500	80	9

✱ TASK A **Write the values for the numbers in the table below.**

Start by placing the last whole digit in the ones column, then work <u>from right to left</u> until there are no more digits.

	Thousands	Hundreds	Tens	Ones
3 647	3 000	600	40	7
8 427				
3 975				
5 927				

✱ TASK B **Write the value of the 4 in each number.**

Number	Value
e.g. 3**4**7	40
4 273	
9 27**4**	
3 **4**76	

Number	Value
100**4**	
3**4**30	
4638	
103**4**2	

Place Value 2

- If the number is <u>whole</u>, then the last digit on the right is in the <u>ones</u> column.
  Digit value tells you how much a digit is worth in a number.
  Look at the digits in the number **1 234 589** below:

Example

	Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
Digit	**1**	**2**	**3**	**4**	**5**	**8**	**9**
Value	1 000 000	200 000	30 000	4 000	500	80	9

TASK A **Write the values for these digits. Work from right to left.**

Number	Thousands	Hundreds	Tens	Ones
3 647	3 000	600	40	7
2 364				
9 845				

TASK B **Write the value of the bold digit.**

Number	Value	Number	Value
3**4**7		**5**99	
5 73**8**		3 12**6**	
3 **9**21		**5** 991	
9 032		4 6**7**9	

TASK C **Use these to write the number.**

Thousands	Hundreds	Tens	Ones	Number
5000	300	40	2	5342
2000	400	70	6	
8000	200	60	6	
9000	500	50	3	

❂ Rounding 1

- Rounding means finding the closest 10, 100 or 1000.
  When the number ends in 5, like 5, 15, 25 you can round up or down (usually up).

1	2	3	4	5	6	7	8	9	**10**	11	12	13	14	15	16	17	18	19	**20**	21	22

✳ TASK A **Circle the number 12.**

How many squares is it away from 10? _____

How many squares is it away from 20? _____

12 is closer to 10, so you round 12 to 10.

1	2	3	4	5	6	7	8	9	**10**	11	12	13	14	15	16	17	18	19	**20**	21	22

✳ TASK B **Round these numbers to the nearest 10. Circle the correct answer.**

8 = 10 or 20 13 = 10 or 20 15 = 10 or 20 16 = 10 or 20

10	11	12	13	14	15	16	17	18	19	**20**	21	22	23	24	25	26	27	28	29	**30**

✳ TASK C **Round these numbers to the nearest 10.**

15 = _____ or _____ 18 = _____ 25 = _____ or _____

27 = _____ 12 = _____ 30 = _____

10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**

✳ TASK D **Use these numbers to find the rounded answers.**

23 = _____ 67 = _____ 45 = _____ or _____ 99 = _____

52 = _____ 38 = _____ 75 = _____ or _____ 14 = _____

✻ Estimation 2

- To estimate an answer we can think about what each number is close to. The number 43 is close to 40. 162 is close to 160.

✻ TASK A **Fill in each of the empty boxes to help you estimate what the answer should be. The first one is done for you.**

a) **61 + 8** is about 60 + 10.

So the answer is about 70.

b) **32 + 11** is about ☐ + ☐.

So the answer is about ☐.

c) **79 – 19** is about ☐ – ☐.

So the answer is about ☐.

d) **151 + 39** is about ☐ + ☐.

So the answer is about ☐.

e) **289 – 32** is about ☐ – ☐.

So the answer is about ☐.

f) **53[illegible] – 4[illegible]** is about ☐ + ☐.

So the answer is about ☐.

✻ TASK B

Circle the best and closest answer, without doing any calculations.

a. 52 + 9 =	70	60	65
b. [illegible] – 32 =	50	60	55
c. 368 + [illegible] =	370	380	390
d. 831 – 29 =	790	800	810
e. 247 + 19 =	270	260	250
f. 998 – 12 =	980	990	1000
g. 1232 + 328 =	1550	1560	1570

✻ TASK C: SMALL GROUP CHALLENGE

Form a small group of 4 to 5 students.

- Measure your heights in centimetres and then estimate the total of your heights.
- Write down the time it takes for each of you to travel to school in minutes and then estimate your total travel time.
- Write down the amount of television each of you watches each week in minutes and then estimate your total television viewing time.

Height (*centimetres*)
Travel time to school (*minutes*)
Television viewing per week (*minutes*)

Where Am I?

TASK A **Use the number line to help you answer each of the following questions.**

a. 5 is eight places above ☐

b. 2 is seven places below ☐

c. -3 is five places below ☐

d. 0 is ten places above ☐

e. -7 is thirteen places below ☐

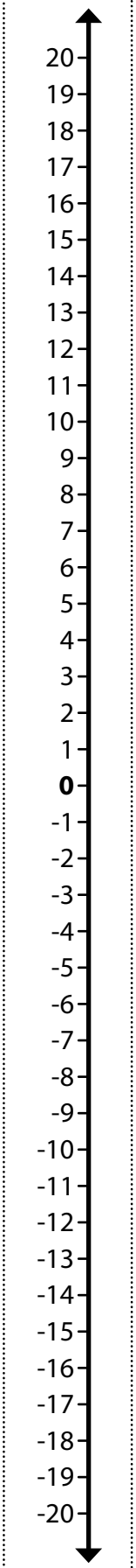
f. -8 is five places above ☐

g. 15 is twenty places above ☐

h. 3 is sixteen places below ☐

i. -12 is four places below ☐

j. -1 is eleven places above ☐



TASK B **You may like to use the number line to answer each of these questions.**

a. 12 more than 3 is ☐

b. 10 less than 5 is ☐

c. 6 less than -4 is ☐

d. 12 more than -18 is ☐

e. 2 more than -5 is ☐ which is less than ☐

f. 7 less than 2 is ☐ which is 4 more than ☐

g. 9 more than [illegible] is ☐ which is 8 less than ☐

h. 50 less than 10 is ☐ which is 6 more than ☐

i. 86 more than 17 is ☐ which is 10 less than ☐

j. 37 more than -14 is ☐ which is 15 less than ☐

k. 12 less than -62 is ☐ which is 21 more than ☐

l. 150 less than -210 is ☐ which is 325 more than ☐

TASK C: CLASS CHALLENGE

Each member of the class is to write down one clue, similar to those above, which represents an integer value. Each member of the class will then state their clue to the class and the others in the class will write down the number they were thinking of. Once all class members have given their clue, go through the answers with your teacher.

Addition 1

Example Look at the following sum, **564 + 432.**

	Hundreds	Tens	Ones
	5	6	**4**
+	4	3	**2**
			6

Step 1: Add the Ones
4 + 2 = 6

	Hundreds	Tens	Ones
	5	**6**	4
+	4	**3**	2
		9	6

Step 2: Add the Tens
6 + 3 = 9

	Hundreds	Tens	Ones
	5	6	4
+	**4**	3	2
	9	9	6

Step 3: Add the Hundreds
5 + 4 = 9

- Remember to work from right to left.

TASK A Try these.

	H	T	O
	5	6	4
+	4	2	1

	H	T	O
	2	5	
+	4	3	3

	H	T	O
	8	5	2
+	1	3	1

TASK B Try these sums.

42 + 22 =	46 + 51 =	264 + 721 =	852 + 147 =
221 + 573 =	343 + 625 =	465 + 322 =	337 + 622 =

❂ Addition: Regrouping 1

Example Look at the following sum: **564 + 428.**

	1		
	5	6	**4**
+	4	2	**8**
			2

	1		
	5	**6**	4
+	4	**2**	2
		9	2

		1	
	5	6	4
+	**4**	2	8
	9	9	2

Step 1: Add the Ones
4 + 8 = 12
The 2 is placed in the Ones column and the 1 is regrouped to the Tens.

Step 2: Add the Tens
1 + 6 + 2 = 9

Step 3: Add the Hundreds
5 + 4 = 9

- Remember to work from right to left.

✱ TASK A **Try these.**

	5	6	4
+	4	2	9

	2	[illegible]	7
+	4	3	7

	8	5	6
+	1	3	5

✱ TASK B **Now try without the grid.**

48	46	254	856
+ 22	+ 36	+ 729	+ 137
367	416	7348	4526
+ 129	+ 229	+ 1439	+ 1347