

Make 100, 1000, 10, 1

: Adding and subtracting using place value

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Activity teaching tips

Purpose

This activity is designed to strengthen students' understanding of place value concepts whilst adding and subtracting.

When to use

The activity can be 'plugged in' at any time of the school year once students have the required pre-requisite skills.

Duration

- 30 minutes when introduced to the whole class for the first time.
- Then, 5 - 10 minutes as a Daily Number Sense activity or a lesson break activity.

Student grouping

- When the activity is introduced to the class for the first time: whole class, teacher centred (to model the activity and how to record on the game score sheet), but with individual student recordings on their own score sheet.
- Subsequent games are still whole class, but are student centred with students working in pairs of similar ability using the same score sheet and rolling their own die to challenge their partner.



Materials for each pair of students

- One score sheet (contains 3 games) each: Either 'Make 100', 'Make 1000', 'Make 10' or 'Make 1'.
- One pencil each.
- One ten face 0-9 numeral die.
- A bowl to roll the die into.
- A calculator to check calculations.

Materials for the teacher

- Large vinyl twelve face 1-12 numeral die or any other die available.
- Whiteboard and markers or IWB to model recordings for two different score sheets.



Creating and storing the activity score sheets

- Print the relevant score sheets single-sided so that students can use the reverse side for working out space if required.
- Cut each A4 page horizontally in half so there are 3 games per half page of paper.
- Store each of the four different activity score sheets in separately labelled snap lock bags (22 x 25) cm.
- Place all 4 bags into one large snap lock bag and label.



Activity instructional sequence

Aim

The aim of the activity is to get a final score as close as possible (either above or below) to the Make number (100, 1000, 10 or 1) after progressively adding or subtracting scores from seven rolls of a die.

The differentiated score sheets

There are four developmentally sequenced score sheets:

- **'Make 100'** is suitable for Years 3-4.
Prior learning: Multiply a single digit number by 10. Add and subtract one- and two-digit numbers.
- **'Make 1000'** is suitable for Years 3-4.
Prior learning: Multiply a single digit number by 10 and 100. Add and subtract two- and three-digit numbers.
- **'Make 10'** is suitable for Years 5-6.
Prior learning: Divide a single digit number by 10; add and subtract decimals with the same number of decimal places.
- **'Make 1'** is suitable for Years 5-6.
Prior learning: Divide a single digit number by 10 and 100; add and subtract decimals with a different number of decimal places.

Allow students to select their own level of difficulty and a corresponding partner to challenge. Then, seat students using similar score sheets in the same physical space in the classroom to assist with teacher instruction.

Activity variations

- **Progressive addition:** Students start at zero and progressively add their scores to get as close as possible to making their final score of either 100, 1000, 10 or 1 after seven rolls of a die.
- **Progressive subtraction:** Once students are confident and having fun with the addition version, progress them to the subtraction version of the activity. Students start at either 100, 1000, 10 or 1 and progressively subtract their scores to get as close as possible to making a final score of zero after seven rolls of a die.

Instructional sequence

- **MAKE IT:** The teacher throws a large vinyl twelve face 1-12 numeral die to a student in the classroom and they 'catch and call' i.e. they catch the die with two hands and call out the number on the uppermost face. **Example: "3"**
- **SAY IT:** Students individually decide how they will score the number rolled and explain their score to their partner.
 - with **'Make 100'** it can be scored as $3 \times 1 = 3$, or $3 \times 10 = 30$
 - with **'Make 1000'** it can be scored as $3 \times 1 = 3$, or $3 \times 10 = 30$, or $3 \times 100 = 300$
 - with **'Make 10'** it can be scored as $3 \div 1 = 3$, or $3 \div 10 = 0.3$
 - with **'Make 1'** it can be scored as $3 \div 10 = 0.3$, or $3 \div 100 = 0.03$
- **WRITE IT:** Students then record the 'Roll', their 'Score', and their 'Progressive Total' on their score sheets as shown on the Student Responses Examples on the following two pages. They must record their information exactly as shown in the Examples otherwise they get disqualified at the end of the game when their score sheet is checked by their partner.
- This is repeated six more times. Teachers can discuss chance concepts at relevant points when throwing the die.
- After seven rolls, ask students to **"Complete your score sheet"** which requires them to:
 - record their 'Final Score' in the box at the bottom of the table
 - complete the sentence at the bottom of the score sheet **My distance from 100, 1000, 10 or 1 is _____ over/under.** which includes drawing a loop around whether they were over or under their Make number.
- Students now swap score sheets with their partner to check the following:
 - are there any calculation errors?
 - have all scores been recorded as a number sentence, i.e. They have numerals, an operation symbol, the equals sign?
 - is all the information to "Complete your score sheet" from the previous instruction completed and correct?Students can then 'disqualify' their partner if any of the above information is incorrect or incomplete
- The teacher then asks all students who were not disqualified to stand up and determines the winner as follows. E.g.
"remain standing if your score was less than twenty away from your Make number"
"remain standing if your score was between 85 and 115" (for playing Make 100)
"remain standing if your score was less than a decade away from your Make number"
- Finally, check the potential winners responses (usually no more than four students) by recording on the board and the class checks. This allows students to see there are many different ways to obtain a winning score sheet!
- As there are 2 or 3 games per half sheet of paper, the whole class now completes games 2 and 3 as a student centred activity, working in pairs. The teacher now:
 - hands out a ten face 0-9 numeral die and a bowl per pair of students.
 - hands out one calculator per pair of students
 - is free to move around the classroom and support individual students as required.

Student responses – Example 1

- Below are examples of typical responses **when students experience this activity for the first time**.
- The responses show the addition version of the activity which requires students to start at zero and progressively add their scores to get as close as possible to making a total of either 100, 1000, 10 or 1 after 7 rolls of a die.
- Initially, students try to get to their required score sheet total as quick as they can (usually after two or three rolls) as they don't understand that the activity requires all 7 rolls of a die for each game.
- For many students, it is not until after they have completed one game as a whole class, and then the whole class goes through the process of determining the class winner that they understand all 7 rolls of the die are used to calculate their final score. It is important that we allow students to make this initial error, but then provide positive feedback after they have reflected on what they did. This promotes students thinking to work mathematically, rather than students just being told what to do.

MAKE 100

Roll	Score x1 or x10	Progressive Total
5	$5 \times 1 = 5$	5
7	$7 \times 10 = 70$	75
3	$3 \times 10 = 30$	105
12	$12 \times 1 = 12$	117
3	$3 \times 1 = 3$	120
4	$4 \times 1 = 4$	124
9	$9 \times 1 = 9$	133
final score		133

My distance from 100 is **33**
~~over~~ under.

MAKE 1000

Roll	Score x1 or x10 or x100	Progressive Total
5	$5 \times 10 = 50$	50
7	$7 \times 100 = 700$	750
3	$3 \times 100 = 300$	1050
12	$12 \times 1 = 12$	1062
3	$3 \times 1 = 3$	1065
4	$4 \times 1 = 4$	1069
9	$9 \times 1 = 9$	1078
final score		1078

My distance from 1000 is **78**
~~over~~ under.

MAKE 10

Roll	Score +1 or +10	Progressive Total
5	$5 \div 1 = 5$	5
7	$7 \div 10 = 0.7$	5.7
3	$3 \div 1 = 3$	8.7
12	$12 \div 10 = 1.2$	9.9
3	$3 \div 10 = 0.3$	10.2
4	$4 \div 10 = 0.4$	10.6
9	$9 \div 10 = 0.9$	11.5
final score		11.5

My distance from 10 is **1.5**
~~over~~ under.

MAKE 1

Roll	Score +1 or +10 or +100	Progressive Total
5	$5 \div 10 = 0.5$	0.5
7	$7 \div 10 = 0.7$	1.2
3	$3 \div 100 = 0.03$	1.23
12	$12 \div 100 = 0.12$	1.35
3	$3 \div 100 = 0.03$	1.38
4	$4 \div 100 = 0.04$	1.42
9	$9 \div 100 = 0.09$	1.51
final score		1.51

My distance from 1 is **0.51** ~~over~~ under.

Student responses – Example 2

- Below are examples of typical responses **after students have experienced this activity several times**.
- The responses show the addition version of the activity which requires students to start at zero and progressively add their scores to get as close as possible to making a total of either 100, 1000, 10 or 1 after 7 rolls of a die.
- Now that students understand that the activity requires all 7 rolls of a die for each game, they now begin to consider the effect of their separate score choices on their overall final score. This is the point in time where we start to see beautiful mental computation strategies at their finest.
- Once students are confident and having fun with this addition version, you can then progress them to the subtraction version of the activity. This requires students to start at either 100, 1000, 10 or 1 and progressively subtract their scores to get as close as possible to making a total of zero after 7 rolls of a die.

MAKE 100

Roll	Score x1 or x10	Progressive Total
4	$4 \times 10 = 40$	40
3	$3 \times 1 = 3$	43
2	$2 \times 1 = 2$	45
8	$8 \times 1 = 8$	53
3	$3 \times 10 = 30$	83
9	$9 \times 1 = 9$	92
11	$11 \times 1 = 11$	103
final score		103

My distance from 100 is **3**
~~over~~ / under.

MAKE 1000

Roll	Score x1 or x10 or x100	Progressive Total
4	$4 \times 10 = 40$	40
3	$3 \times 100 = 300$	340
2	$2 \times 100 = 200$	540
8	$8 \times 10 = 80$	620
3	$3 \times 100 = 300$	920
9	$9 \times 1 = 9$	929
11	$11 \times 1 = 11$	940
final score		940

My distance from 1000 is **60**
 over / ~~under~~.

MAKE 10

Roll	Score +1 or +10	Progressive Total
4	$4 \times 1 = 4$	4
3	$3 \times 1 = 3$	7
2	$2 \div 10 = 0.2$	7.2
8	$8 \div 10 = 0.8$	8.0
3	$3 \div 10 = 0.3$	8.3
9	$9 \div 10 = 0.9$	9.2
11	$11 \div 10 = 1.1$	10.3
final score		10.3

My distance from 10 is **0.3**
~~over~~ / under.

MAKE 1

Roll	Score +1 or +10 or +100	Progressive Total
4	$4 \div 10 = 0.4$	0.40
3	$3 \div 100 = 0.03$	0.43
2	$2 \div 10 = 0.2$	0.63
8	$8 \div 100 = 0.08$	0.71
3	$3 \div 100 = 0.03$	0.74
9	$9 \div 100 = 0.09$	0.83
11	$11 \div 100 = 0.11$	0.94
final score		0.94

My distance from 1 is **0.06** over / ~~under~~.

MAKE 100

Roll	Score x1 or x10	Progressive Total
final score		

My distance from 100 is _____
over / under.

MAKE 100

Roll	Score x1 or x10	Progressive Total
final score		

My distance from 100 is _____
over / under.

MAKE 100

Roll	Score x1 or x10	Progressive Total
final score		

My distance from 100 is _____
over / under.



MAKE 100

Roll	Score x1 or x10	Progressive Total
final score		

My distance from 100 is _____
over / under.

MAKE 100

Roll	Score x1 or x10	Progressive Total
final score		

My distance from 100 is _____
over / under.

MAKE 100

Roll	Score x1 or x10	Progressive Total
final score		

My distance from 100 is _____
over / under.

MAKE 1000

Roll	Score x1 or x10 or x100	Progressive Total
final score		

My distance from 1000 is _____
over / under.

MAKE 1000

Roll	Score x1 or x10 or x100	Progressive Total
final score		

My distance from 1000 is _____
over / under.

MAKE 1000

Roll	Score x1 or x10 or x100	Progressive Total
final score		

My distance from 1000 is _____
over / under.



MAKE 1000

Roll	Score x1 or x10 or x100	Progressive Total
final score		

My distance from 1000 is _____
over / under.

MAKE 1000

Roll	Score x1 or x10 or x100	Progressive Total
final score		

My distance from 1000 is _____
over / under.

MAKE 1000

Roll	Score x1 or x10 or x100	Progressive Total
final score		

My distance from 1000 is _____
over / under.

MAKE 10

MAKE 10

MAKE 10

Roll	Score +1 or +10	Progressive Total
final score		

Roll	Score +1 or +10	Progressive Total
final score		

Roll	Score +1 or +10	Progressive Total
final score		

My distance from 10 is _____
over / under.

My distance from 10 is _____
over / under.

My distance from 10 is _____
over / under.



MAKE 10

MAKE 10

MAKE 10

Roll	Score +1 or +10	Progressive Total
final score		

Roll	Score +1 or +10	Progressive Total
final score		

Roll	Score +1 or +10	Progressive Total
final score		

My distance from 10 is _____
over / under.

My distance from 10 is _____
over / under.

My distance from 10 is _____
over / under.

MAKE 1

Roll	Score +1 or +10 or +100	Progressive Total
final score		

My distance from 1 is _____ over / under.

MAKE 1

Roll	Score +1 or +10 or +100	Progressive Total
final score		

My distance from 1 is _____ over / under.



MAKE 1

Roll	Score +1 or +10 or +100	Progressive Total
final score		

My distance from 1 is _____ over / under.

MAKE 1

Roll	Score +1 or +10 or +100	Progressive Total
final score		

My distance from 1 is _____ over / under.