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Lesson 1 COUNTING PATTERNS

LESSON OBJECTIVES

Children will:

- Skip count by 5s, 10s and 100s to recognise number patterns.
- Skip count by 2s to identify odd and even numbers.

RELATED AUSTRALIAN CURRICULUM CONTENT DESCRIPTIONS

See page 24 to cross-reference this lesson with aligned Australian Curriculum content descriptions.

PREREQUISITES

Children should be able to:

- Identify and create number patterns.
- Count by ones from 1 to 100.
- Identify numbers that come just before and just after two sequential numbers between 1 and 100.

RELATED STAMS® PLUS LESSONS

- **Book A – Lesson 5**

In *Add three numbers*, children learn the strategy of counting on in order to add.

- **Book A – Lesson 6**

As children use the hundreds chart in *Count to 100*, they will observe the pattern that repeats every ten numbers, which is the foundation of base-ten place value.

VOCABULARY

PAGE 4

- **skip count:** count by a number other than 1
by 5s: 5, 10, 15, . . .
by 10s: 10, 20, 30, . . .
by 100s: 100, 200, 300, . . .
by 2s: 2, 4, 6, . . .

PAGE 6

- **even number:** a number that you get when you multiply a whole number by 2
- **odd number:** a number that is **not** even

MATHS BACKGROUND

In this lesson, children learn that skip counting is a quick way to count groups of objects that have the same value. Children learn, for example, that they may skip count groups of 5 or groups of 10.

Children make groups of 2 to help them understand the meanings of *odd* and *even* numbers. They learn that after breaking up a number into groups of 2, if 0 is left over, then the number is even; if 1 is left over, then the number is odd. Children then find out that the sum of two equal numbers is always even. Understanding odd and even numbers is fundamental for multiplication and division concepts.

Throughout this lesson children work with base-ten blocks, connecting cubes and dominoes. Base-ten blocks are effective tools for children as they continue to work with greater numbers and more complex computation.

Modelled Instruction

LESSON 1 COUNTING PATTERNS
PART ONE

How can you use a hundreds chart to help you count by 5s and 10s?

Explore

You can find patterns of 5s and 10s on a hundreds chart.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Think

Olivia uses the hundreds chart to **skip count** by 5s to 40. She starts at number 5. She counts on five boxes. What number is in the box? 10. Look down the 5 column and the 10 column. What patterns do you see? numbers that end in 5 or 0.

Connect

Skip counting by 5s to 40 is the same as saying: 5, 10, 15, 20, 25, 30, 35, 40.

Skip counting by 10s to 40 is the same as saying: 10, 20, 30, 40.

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Guided Instruction

Counting patterns

Let's Talk How is skip counting by 10s like skip counting by 5s?

Think It Through

Solve.

Tyler uses hundreds blocks to count by 100s. He starts with 100. What numbers does he say?

100

200

300

400

500

600

700

800

900

1000

Solution: Tyler says 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000.

Skip counting by 100s is like skip counting by 10s.

Your Turn **Solve.**

1. Emma starts at 200 and skip counts by 100. What three numbers will she say next?

A 210, 220, 230
 B 300, 400, 500
 C 300, 200, 100
 D 400, 600, 800

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AT A GLANCE

Children activate their background knowledge of patterns and learn to identify the number patterns revealed by skip counting on a hundreds chart.

STEP BY STEP

PAGE 4

- Introduce the **Question** at the top of the page.
- Draw children's attention to the hundreds chart in **Explore**.

Tip: Ask children to use a finger to trace across the top row of the chart from 1 to 5. Explain that all the numbers directly below this 5 are in the 5 column. Have children point to the 10 in the top row. Explain that all the numbers directly below this 10 are in the 10 column.

- Read **Think** with children. Have children count the boxes from 1 to 5 and from 6 to 10 to confirm that they are counting by 5s.
- Discuss **Connect** with children. Have them extend each counting pattern.

PAGE 5

- Organise children in pairs or groups for **Let's Talk** and monitor their discussions.
- Point out that the number 10 is made of two 5s. So, every number children say when they skip count by 10s, they will also say when they skip count by 5s.
- Read the **Think It Through** problem with children.
- Guide children in solving the problem.

EAL/D Support: Gather 10 hundreds blocks. Skip count by 100s as you stack one block on top of another to count from 100 to 1000. Ask children to repeat the names for each number.

- Monitor children as they complete **Your Turn**. Then discuss the correct answer.

Error Alert: Children who answer 210, 220, 230 are skip counting by 10s. Ask them to skip count by 10s and then by 100s from 200. Write the numbers children say and compare results.



ADDITIONAL ACTIVITY

See **Hands-on Activity** (page 36).

Modelled Instruction

PART TWO

How can you tell if a number is odd or even?

You can tell if a number is **even** or **odd** by making groups of 2.

Explore

0 is left over. So, 6 is even.

Explore

1 is left over. So, 5 is odd.

Think

Tang puts his socks into 5 groups of 2. Then he skip counts by 2s to find how many socks he has. Does Tang have an odd or an even number of socks?

Count: 2 4 6 8 10

How many socks does Tang have? 10

Connect

There are no socks left over. 10 is an even number.

Let's Talk

The numbers 2, 4, 6, 8 and 10 are even. The numbers 1, 3, 5, 7 and 9 are odd. Look at the hundreds chart on page 4. How can you tell if 38 is odd or even?

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Guided Instruction

Counting patterns

Think It Through

Solve.

Lila says the sum of two numbers that are the same, or two equal groups, is always even. Is she correct?

a. Add two 6s.
 $6 + 6 = \underline{12}$.
 12 is two equal groups of 6.

b. Add two 10s.
 $10 + 10 = \underline{20}$.
 20 is two equal groups of 10.

Solution: Lila is correct.

6 is 2 equal groups of 3.
10 is 2 equal groups of 5.

Your Turn **Solve.**

2. Ms Block had these coins in her purse. Circle the coins to make groups of two.

Is the number of coins odd or even? Tell how you know.
 The number of coins is odd. When I made groups of _____
2 coins, 1 coin was left over.

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AT A GLANCE

Children break up numbers into equal groups of 2 to determine whether those numbers are odd or even.

STEP BY STEP

PAGE 6

- Introduce the **Question** at the top of the page.
- Read **Explore** with children. Use 6 cubes to model the three groups of 2. Point out that no cubes are left over. Use another 5 cubes to model the two groups of 2. Hold up the 1 cube to show that it is left over.
- Read **Think** with children.
- Help children read each sentence in **Connect**. Explain that, when Tang counted, he found no socks left over because he has an even number of socks.
- Organise children in pairs or groups for **Let's Talk** and monitor their discussions.
- Have children point to the 8 in the top row of the hundreds chart on page 4. Ask them to trace down the 8 column to find 38. Be sure they understand that because 8 is an even number, every other number with 8 in the ones place is also even. So, 38 is even.

PAGE 7

- Read the **Think It Through** problem with children.

EAL/D Support: Use counters to model two groups of 3. Have children identify the number of counters in each group. Then point to the groups together and explain that they are *equal groups* because they have the *same number* of counters.

- Guide children as they solve the problem. Pause for children to fill in each missing number. Then discuss each response and the solution.
- Monitor children as they complete **Your Turn**. Then discuss the correct answer.

Error Alert: Children who say that Ms Block had an even number of coins may have circled more than two coins at a time. Tell children to check that they drew each circle around just two coins.



ADDITIONAL ACTIVITY

See **Reteaching Activity** (page 36).

Modelled Practice

PART THREE: Choose the right answer

Solve

Hoppy starts at 0. He hops only on even numbers. Hoppy is on number 4. Which three numbers will he hop on next?

A 5, 6, 7
 B 8, 10, 12
 C 5, 7, 9
 D 6, 8, 10

Check

Check to see if you chose the correct answer.

Hoppy is on number 4.
He hops to the next even number, 6.
The even numbers after 6 are 8 and 10.

So, the correct answer is D.

Why are the other answer choices not correct?

<input type="radio"/> A 5, 6, 7	5 and 7 are odd.
<input type="radio"/> B 8, 10, 12	The even number that comes after 4 is 6, not 8.
<input type="radio"/> C 5, 7, 9	Hoppy hops on even numbers. 5, 7 and 9 are odd numbers.

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Guided Practice

Counting patterns

Your Turn Solve each problem.

- Make groups of two with a number. If 0 is left over, the number is even. If 1 is left over, the number is odd.
- The sum of two numbers that are the same is always an even number.

3. Count by 5s. Which numbers come next?
30, 35, 40, 45, __, __

A 40, 45
 B 45, 50
 C 50, 55
 D 50, 60

4. Which group has 2 odd numbers?

A 6, 14
 B 8, 10
 C 12, 16
 D 9, 13

5. Tom has 11 socks. He needs an even number. How many more socks does Tom need?

A 0
 B 1
 C 2
 D 4

6. Start at 65. Skip count by 5s. What numbers will you say?

A 70, 75, 80, 85
 B 70, 72, 74, 76
 C 66, 67, 68, 69, 70
 D 75, 85, 95, 105

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AT A GLANCE

Children reinforce their understanding of skip counting by solving a multiple-choice problem and analysing correct and incorrect answer choices.

STEP BY STEP

PAGE 8

- Tell children that this page models finding the correct answer to a multiple-choice problem.
- Help children read the problem in **Solve**. Help them to trace Hoppy’s hops along the number line.
- Discuss the correct and incorrect answer choice in **Check**.

PAGE 9

- Monitor children as they complete **Your Turn**.
- Organise children in pairs or small groups to discuss the correct answers and any errors that they may have made.
- Review all the answer choices with the class.



ADDITIONAL ACTIVITY

See **Vocabulary Activity** (page 36).

Answer Analysis

3. A Skip counted backwards instead of forwards.
 B Repeated the 45 before skip counting on to 50.
 C When skip counting by 5s, the numbers after 45 are 50 and 55.
 D Skip counted by 5s and then by 10s.
4. A 6 and 14 are even numbers.
 B 8 and 10 are even numbers.
 C 12 and 16 are even numbers.
 D 9 and 13 can’t make equal groups.
5. A Thought that 11 is an even number.
 B $11 + 1 = 12$, which is an even number.
 C Thought that adding the even number 2 would result in an even number.
 D Thought that adding the even number 4 would result in an even number.
6. A When skip counting by 5s, the numbers after 65 are 70, 75, 80, 85.
 B Skip counted by 5s to 70, then by 2s to 76.
 C Counted by 1s instead of by 5s.
 D Skip counted by 10s instead of by 5s.

Modelled Practice

PART FOUR: Write the best answer

Study the model.


Student model

Show

Jessie gives clues about dominoes. Here are Jessie's clues.

- One square shows an odd number.
- The other square shows an even number.
- There are 7 dots in all.
- Each square is less than 5.

What are the numbers on the domino?
Show your work.



3 is odd. 4 is even.
3 dots plus 4 dots is 7 dots.
Both are less than 5.

Solution: The domino shows the numbers 3 and 4.

Explain how you got your answer.

I thought of two numbers that add to 7.
I thought of 1 and 6. But 6 is greater than 5.
I tried 3 and 4. This worked. So, the domino has 3 dots in one square and 4 dots in the other square.

Explain

Show each step.

Answer the question.

Give details.

Use maths words.

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Guided Practice

Counting patterns

Your Turn Solve the problem.

7. Students built cube towers in maths class. Each tower had 10 cubes. Dan built 8 towers. How many cubes did he use?
Show your work.

CHECKLIST

Did you . . .

- show the steps?
- answer the question?
- give details?
- use maths words?

1 tower

2 towers

3 towers

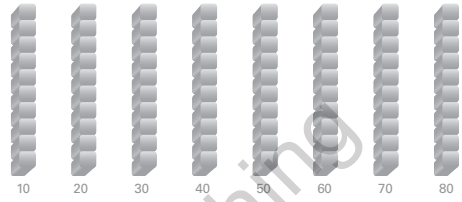
4 towers

5 towers

6 towers

7 towers

8 towers



Solution: Dan used 80 cubes.

Explain how you got your answer.

I used cubes to show Dan's towers. I built 8 towers. Each one had 10 cubes. I put the towers in a row. I wrote the number of towers. Then I skip counted by 10s and got 80.

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AT A GLANCE

Children study a model answer to an extended-response problem.

STEP BY STEP

PAGE 10

- Tell children that this page shows a complete answer to the problem. It shows all the steps and explains the steps with maths words.
- Help children read the problem in **Show**. Discuss how each mathematical step leads to the solution.

Tip: Prepare large facsimiles of the 1–6 and 3–4 dominoes. Hold up each as you discuss why that domino either does or does not match one of Jessie's clues.

- Read **Explain** with children. Have children circle the maths words in the explanation.
- Direct children's attention to the notes in the right margin. Tell children that these notes explain why the answer is complete.

PAGE 11

- Monitor children as they complete **Your Turn**.
- Encourage children to follow the **Checklist** to write the best answer.
- Have children discuss their work with a partner. Then discuss children's answers as a class.

Answer Analysis

7. See the sample answer. The answer shows all the steps taken to solve the problem, including an explanation of using towers and skip counting. The solution answers the question. The explanation provides important details about how the problem was solved and uses the maths words *row* and *skip count*.



ADDITIONAL ACTIVITY

See **Real-World Connection** (page 36).



ADDITIONAL ACTIVITY

See **School-Home Connection** (page 36).

Independent Practice

PART FIVE: Prepare for a test

Remember:

- Make groups of two with a number. If 0 is left over, the number is even. If 1 is left over, the number is odd.
- If you add two of the same number, the sum will always be an even number.

Solve each problem.

8. There are 9 houses on Bud Street. Each house has 100 flowers. Skip count by 100s to find how many flowers in all.

Ⓐ 9
Ⓑ 90
● 900
Ⓒ 1000

9. Which two numbers are missing?
370, 380, _____, 400, _____, 420

Ⓐ 385 and 390
Ⓑ 390 and 395
Ⓒ 390 and 405
● 390 and 410

10. Jamal skip counts by 100s. He starts at 500. Which of these does he say?

Ⓐ 400, 500, 600
Ⓑ 550, 650, 750
● 600, 700, 800
Ⓒ 300, 400, 500

11. Keesha uses tens rods to count by 10s. She starts with 9 rods. What numbers does she say?

● 100, 110, 120
Ⓑ 90, 80, 70
Ⓒ 80, 90, 100
Ⓓ 9, 10, 11

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Independent Practice

Counting patterns

12. Which of these is an even number?

Ⓐ 7 ● 10
Ⓑ 9 Ⓒ 11

13. Which group has 2 even numbers?

● 4, 16 Ⓒ 3, 9
Ⓑ 1, 7 Ⓓ 5, 11


14. There were 67 people at a game. Then 10 more people came. Later, 10 more came. How many people were at the game then?


Skip count by 10s to find the answer.


67, 77, 87

Solution: 87 people.

15. Three sisters want to know how many fingers and toes they have in all. How can they skip count to find out? Show your work.

Sister 1: 

Sister 2: 

Sister 3: 

Solution: The sisters have 60 fingers and toes altogether.

Explain how you got your answer.

Each sister has 10 toes and 10 fingers. So, I skip counted by 10s six times. 10, 20, 30, 40, 50, 60.

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AT A GLANCE

Children practise skip counting and identifying odd and even numbers to solve problems that might appear on a mathematics test.

STEP BY STEP

PAGES 12–13

- Tell children that they will practise solving problems using skip counting and odd and even numbers.
- Point out the tips at the top of page 12. Explain to children that these tips will help them answer the problems correctly.
- Tell children to complete problems 8–15 on pages 12 and 13. Encourage children to check their answers.
- Discuss the correct responses as a class.

Answers and Explanations

8. Ⓒ Skip count by 100 nine times: 100, 200, 300, 400, 500, 600, 700, 800, 900.
9. Ⓓ When skip counting by 10s, 390 comes after 380 and 410 comes after 400.
10. Ⓒ When skip counting by 100s from 500, the next numbers are 600, 700, 800.
11. Ⓐ 9 tens = 90. Count by 10s from 90: 100, 110, 120.
12. Ⓒ 10 makes 5 equal groups of 2, so it is an even number.
13. Ⓐ 4 and 16 make equal groups with nothing left over, so they are even numbers.

(continued on page 35)

(continued from page 34)

14. Ten more people came to the game each time, so skip count by 10s from 67: 67, 77, 87.
15. See the sample answer. This answer shows all the steps the child took to solve the problem including drawing a picture to model 10 fingers and 10 toes for each sister. The solution answers the question. The explanation provides important details about how the child solved the problem and uses the maths words *skip counted by 10s*. (Alternatively, the child may skip count by 5s or 20s to find the solution.)



ASSESSMENT AND REMEDIATION

- Ask children to skip count by 10s three times starting from 230. (230, 240, 250, 260)
- For children who are still struggling, use the chart below to guide remediation.
- After providing remediation, check children's understanding. Ask children to explain their thinking as they skip count by tens three times starting from 170. (170, 180, 190, 200)

If the error is . . .	Children may . . .	To remediate . . .
230, 232, 234, 236	not realise that they need to skip count by tens, and not by twos.	Have children use base-ten blocks to model 230. Then have them add tens rods, one at a time to the model, as they skip count to show 240, 250 and 260.
230, 330, 430, 530	not be able to identify the tens digit in a three-digit number.	Have children use base-ten blocks to model 230. Ask them to name the number of tens in 230. Give them one more tens rod and ask them to name the new number. (240) Continue adding one more ten and naming the total.
230, 330, 430, 530	not realise that they need to skip count by tens, and not by hundreds.	Write the number 230 on the board. Underline the 3 and explain that this is 3 tens. Tell children that when they count by tens, this digit changes. Model counting 230, 240, 250, 260.



ADDITIONAL ACTIVITY

For children who have mastered the skills in this lesson, see **Challenge Activity** (page 36).

ADDITIONAL ACTIVITIES



Hands-on Activity

Use fingers to count by 5s and by 10s.

Explain that this is a fast way to count the number of fingers in the room. Have the first child raise one hand, wiggle fingers and say “5”. The second child raises a hand, wiggles fingers and says “10”.

Continue until everyone has a turn, including you. Then start over with the first child raising his or her other hand and saying the appropriate number, such as 75. Continue until everyone has had a second turn. If there are more than 10 people in the class, lead children to determine what to do when 100 is reached.

Repeat the activity with the first child raising both hands, wiggling 10 fingers and saying “10”.



Reteaching Activity

Use partners to determine if a number is odd or even.

Explain that there is an easy way to tell if the number of children in the class is even or odd. Call children up one at a time. Have the first two stand together and call them “partners”. Then have the next two stand together. Continue until all children are standing. If the last child called has a partner, then the number of children is even. If there is no partner for that child, then the number is odd. In other words, a number is odd if there are leftovers when making pairs.



Vocabulary Activity

Demonstrate meanings.

Materials: balance

Take a normal step. Go back to that same beginning point and skip. Point out that you moved further when skipping than when you stepped. You skipped over some space. The same is true when you skip count, you skip over some numbers. Ask what numbers you skip over when you count by 5s from 10 to 20.

Use a balance to show even and odd numbers. When the same number of items is put in both pans, the balance stays nice and *even*. If one more item is put

in one pan, the balance is not even. Demonstrate with odd and even numbers. Have children count the items on both sides and tell if the number is odd or even.



Real-World Connection

Relate even and odd to counting by 5s and 10s.

Materials: 60–70 connecting cubes (optional)

Have children answer these questions: When you count by 5, are the numbers odd, even or both? When you count by 10, are the numbers odd, even or both?

You may wish to display a hundreds chart or provide connecting cubes for checking answers. For example, show that the number 25 cannot be divided into two groups of equal size.



School-Home Connection

Inform families about counting by 5s and 10s and about even and odd numbers.

Give each child a copy of the School-Home Connection activity sheet for Lesson 1 (page 157) to share with the family. The activity is about skip counting household items by 5s and 10s and determining whether a number is odd or even.



Challenge Activity

Determine if a number is even or odd without counting.

To reinforce the concept that an even number can be separated into equal groups, ask questions like the ones below. Then discuss each answer by counting or drawing pictures to aid understanding.

Is the total number of eyes in the room an even or an odd number? What about feet? What are some other things that you know for sure will be an even number?

Is the number of sides of a triangle an even or an odd number? What about two triangles? Is the total number of wheels on 5 tricycles an even or an odd number?