



EduTrend Contents

EDUTECH · STEM RESOURCES FOR TEACHERS · PRIMARY

Consecutive Sums

A rich problem: which numbers are sums of consecutive numbers?

Ages 9–11

Level: Developing

50 minutes

Pairs · up to 30

Activity 02

Inside: activity at a glance · step-by-step session plan · facilitator notes · 3 pupil worksheets · assessment checklist

ACTIVITY 02 · AT A GLANCE

Consecutive Sums

Pupils explore which numbers from 1 to 30 can be made by adding two or more consecutive whole numbers, such as $9 = 4 + 5 = 2 + 3 + 4$. They record results in a table, look for patterns and make conjectures. The class discovers that some numbers seem impossible and tries to explain why.

Learning outcomes

By the end of the session pupils can:

- work systematically;
- record results in a table;
- spot patterns and make conjectures;
- explain or justify a pattern.

KEY WORDS

consecutive · sum · pattern · conjecture · odd · power of two

CURRICULUM LINKS

Science: looking for patterns in data. Computing: systematic search. History: famous mathematicians.

1**QUESTION**

What will we find out?

2**PREDICT**

What do we expect?

3**EXPLORE**

Use the resource

4**RECORD**

Capture evidence

5**EXPLAIN**

What did we learn?

6**EXTEND**

Where next?

Materials (per pair)

- Number cards 1–15
- Squared paper
- Worksheets 1, 2 and 3

Before the session

- Prepare number cards.
- Draw a class results table.
- Plan pairs.
- Print worksheets.

SAFETY

No specific hazards. Keep cards on desks.

ACTIVITY 02 · SESSION PLAN

Step by step

Rich problems like this work well as starters or extensions; leave time for conjectures.

Time	What happens	Say or ask
0–5 min Hook	Show $9 = 4 + 5 = 2 + 3 + 4$.	<i>"Can every number do this?"</i>
5–25 min Explore	Test 1 to 30.	<i>"How are you organising?"</i>
25–35 min Pool	Class table.	<i>"Which numbers are missing?"</i>
35–45 min Conjecture	Pattern in the missing numbers.	<i>"What do 1, 2, 4, 8, 16 have in common?"</i>
45–50 min Explain	Odd numbers and two consecutive numbers.	<i>"Why can every odd number above 1 be made?"</i>

CHALLENGE CARD (print or copy onto the board)

Find which numbers from 1 to 30 can be written as sums of consecutive whole numbers, make a conjecture about the others and explain part of the pattern.

ACTIVITY 02 · FACILITATOR NOTES

The teaching know-how in brief

Every odd number greater than 1 is the sum of two consecutive numbers, because $n + (n + 1) = 2n + 1$. Multiples of 3 above 3 are sums of three consecutive numbers.

The numbers that cannot be written as a sum of two or more consecutive positive whole numbers are the powers of two: 1, 2, 4, 8, 16, 32 and so on. Pupils can find the pattern even if a full proof comes later.

Common ideas to listen for

- “Even numbers never work.” $6 = 1 + 2 + 3$.
- “One example proves a rule.” Test more.
- “If I cannot find it, it is impossible.” Search systematically.

Adapting the activity

Support

Start with numbers up to 15.

Stretch

Find all the ways to make 15.

WORKSHEET 1

Results

Name: _____

Class: _____ Date: _____

Record sums.

Results

Number	Consecutive sum(s)
1-5	
6-10	
11-15	
16-20	
21-25	
26-30	

WORKSHEET 2

Patterns

What do you notice?

Patterns

Pattern	Evidence
1	
2	
3	

WORKSHEET 3

Conjecture

Write and explain.

Our conjecture and why we think it is true

FOR THE TEACHER

Assessment checklist

Use during the session. One sheet covers up to eight pupils; copy as needed.

Pupil	Works systematically	Spots patterns	Explains conjecture

Suggested codes: W = working towards · E = expected · G = greater depth

ABOUT THIS ACTIVITY

Consecutive Sums is a sample activity from the EduTrend Contents Edutech STEM Resources for Teachers programme (primary, level: developing). Every activity in the programme follows the same format: a practical challenge, a clear session plan, facilitator notes and ready-to-print worksheets, so that teachers, club leaders and parents can run it without extra preparation.

Full 15-, 20- and 32-week programmes are available from EduStore at edutrend.org.

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