



EduTrend Contents

EDUTECH · TECHNOLOGY · PRIMARY

Binary Bracelets

Discover how computers store letters using only 0s and 1s

Ages 8–11

Level: Developing

50 minutes

Individual and 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

Binary Bracelets

Pupils use five cards showing 16, 8, 4, 2 and 1 dots to discover how binary numbers work by turning cards face up (1) or down (0). They decode a short message using a letter code, then make a paper or bead bracelet that stores their initial in 8-bit binary using two colours.

Learning outcomes

By the end of the session pupils can:

- explain that computers store data as 0s and 1s;
- convert small numbers to binary;
- decode binary letters;
- represent data in a different form.

KEY WORDS

binary · bit · byte · code · data · represent

CURRICULUM LINKS

Maths: place value and doubling.
Art: pattern design. History: codes and signals.

1**EXPLORE**

How does it work?

2**DECOMPOSE**

Break the problem down

3**DESIGN**

Plan the steps

4**BUILD**

Make or program it

5**DEBUG**

Find and fix errors

6**REFLECT**

Is it the right tool?

Materials (per pupil)

- Binary dot cards (16, 8, 4, 2, 1)
- Beads or paper strips in two colours
- Letter code chart
- Worksheets 1, 2 and 3

Before the session

- Print dot cards.
- Prepare an 8-bit code chart for capital letters (A = 01000001).
- Sort beads.
- Print worksheets.

SAFETY

Keep small beads away from younger children and off the floor.

ACTIVITY 02 · SESSION PLAN

Step by step

Let pupils discover the doubling pattern before naming it.

Time	What happens	Say or ask
0–10 min Hook	Show dot cards; show only 5.	<i>"Which cards make 5?"</i>
10–22 min Explore	Make numbers 0 to 31.	<i>"What is the biggest number?"</i>
22–32 min Decode	Decode a binary message.	<i>"What does it say?"</i>
32–45 min Make	Make an initial bracelet.	<i>"Can your partner read it?"</i>
45–50 min Reflect	Where does binary appear?	<i>"Why only two symbols?"</i>

CHALLENGE CARD (print or copy onto the board)

Convert numbers to binary, decode a secret message and make a bracelet that stores your initial in 8-bit binary.

ACTIVITY 02 · FACILITATOR NOTES

The computing know-how in brief

Computers store all data using two states, written as 0 and 1. Each 0 or 1 is a bit, and 8 bits make a byte. Each place in a binary number is worth double the place to its right.

Letters are stored using agreed codes. In the ASCII code, capital A is 65, which is 01000001 in 8-bit binary. Pictures, sounds and videos are also stored as binary numbers.

Common ideas to listen for

- “Computers understand words.” They store numbers in binary.
- “Binary 10 means ten.” It means two.
- “More 1s means a bigger number.” Place value matters.

Adapting the activity

Support

Use only the 4, 2 and 1 cards.

Stretch

Convert numbers up to 255.

WORKSHEET 1

Binary numbers

Name: _____

Class: _____ Date: _____

Use the dot cards.

Binary numbers

Number	16	8	4	2	1
5					
9					
14					
21					
31					

WORKSHEET 2

Decode the message

Use the letter code chart.

Decode the message

Binary	Letter
1	
2	
3	
4	
5	

WORKSHEET 3

My bracelet

Plan your bracelet.

My initial, its binary code and my colour key

FOR THE TEACHER

Assessment checklist

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

Pupil	Converts to binary	Decodes letters	Explains binary storage

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

ABOUT THIS ACTIVITY

Binary Bracelets is a sample activity from the EduTrend Contents Edutech Technology 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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