

Code Paths

Compare patterns that carry one message.

4-PS4-3 "Generate and compare multiple solutions that use patterns to transfer information. Clarification Statement: Examples of solutions could include drums sending coded information through sound waves..."

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline the pattern used by each solution. Circle the words that tell how each pattern travels, then label the two solutions 1 and 2 so you can compare them.

Sending a Water Report

- ① People can send a message without using spoken words. A pattern carries the information from a sender to a receiver. The pattern may travel as sound, light, or an electronic signal. The receiver must know the code, or rule, for changing the pattern back into a message. Different codes can carry the same idea in different ways.
- ② At a field station, two hikers need to report that they found water. One hiker uses a drum code. Three quick beats mean "water," while one long beat means "help." Sound waves move through the air from the drum to a listener. This solution works when the listener can hear the beats and has learned what each beat pattern means.
- ③ The second hiker uses a black-and-white grid. In this code, each square represents either 1 or 0. A row of squares can describe part of a simple picture, and many rows can describe the whole picture. The grid pattern can travel in an electronic signal. A receiver changes the 1's and 0's back into black and white squares.

2 ANSWER WITH EVIDENCE Use the passage

1 How does the drum solution transfer information from one hiker to the other?

2 Compare the drum code and the grid code. What kind of pattern does each one use?

3 A listener hears three quick beats. What message should the listener decode, and what makes the decoding possible?

4 Which solution could send a simple picture? Use two details from the passage to explain your choice.

3 YOUR TURN Your own words

Choose the message "Meet at the tree." Create two coded solutions, a drum pattern and a 1/0 pattern. Write each code and its key, then write exactly two sentences comparing how the patterns transfer the same message.

PART 1 • READ AND MARK

Underline the pattern used by each solution. Circle the words that tell how each pattern travels, then label the two solutions 1 and 2 so you can compare them. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	How does the drum solution transfer information from one hiker to the other?	The hiker makes a beat pattern on a drum. Sound waves carry the beats through the air to a listener who knows the code.
2	Compare the drum code and the grid code. What kind of pattern does each one use?	The drum code uses quick and long beats. The grid code uses squares that represent 1 or 0, shown as black or white.
3	A listener hears three quick beats. What message should the listener decode, and what makes the decoding possible?	The message is "water." The listener can decode it because the listener has learned what the beat pattern means.
4	Which solution could send a simple picture? Use two details from the passage to explain your choice.	The black-and-white grid could send a simple picture. Its squares represent 1 or 0, and many rows of squares can describe a whole picture.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Drum code: short-short-long / long-short / long-long. Key: short-short-long = meet, long-short = at, long-long = tree. 1/0 code: 101 / 011 / 110. Key: 101 = meet, 011 = at, 110 = tree. The drum code transfers sound-wave patterns that a listener hears. The 1/0 code transfers electronic patterns, and it could also be shown with black and white squares.

Accept any two clear, different coded solutions that represent the same message and include a usable key. The comparison should accurately describe how each pattern can transfer information.