

Who Stays and Who Sleeps?

Page 1 — Crack the animal codes

Every picture hides a number. The same picture always means the same number. Find the numbers, then read the name of an animal!

Puzzle 1 — This animal stays awake all winter

$$\begin{array}{lclclcl}
 \text{acorn} & \times & \text{acorn} & = & 4 & \text{star} & \times & \text{acorn} & = & 6 \\
 \text{apple} & = & \text{acorn} & \times & \text{star} & \text{mushroom} & = & \text{star} & \times & \text{star} \\
 \text{pumpkin} & = & \text{mushroom} & \times & \text{acorn} & \text{pumpkin} & \div & \text{apple} & = & \text{star}
 \end{array}$$

Write the number for each picture:



= _____



= _____



= _____



= _____



= _____

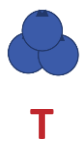
Put the letters in order from the smallest number to the biggest. Which animal is it?

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Puzzle 2 — This animal hibernates

$$\begin{array}{lclclcl}
 \text{pear} & \times & \text{pear} & = & 16 & \text{sunflower} & - & \text{pear} & = & 3 \\
 \text{blueberries} & = & \text{pear} & \times & \text{sunflower} & \text{blueberries} & \div & \text{sunflower} & = & \text{pear}
 \end{array}$$

Write the number for each picture:



= _____



= _____



= _____

Put the letters in order from the smallest number to the biggest. Which animal is it?

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Page 2 — The mouse stores seeds

A deer mouse does not sleep through the winter. In autumn it stores seeds in four burrows: A, B, C and D. The burrows hold 20, 36, 40 and 45 seeds — but which is which? Here is what the mouse remembers:

1. The number of seeds in burrow A is divisible by 9.
2. Burrow B holds an odd number of seeds.
3. Burrow D holds twice as many seeds as burrow C.

How many seeds are in each burrow? Fill in the table and explain how you know.

Burrow	A	B	C	D
Seeds				

Explain: which clue did you use first, and why?

- a) How many seeds did the mouse store altogether? _____
- b) In winter the mouse eats 4 seeds a day from burrow C. After how many days is burrow C empty? _____ days
- c) Then it eats 4 seeds a day from burrow D. For how many days do burrows C and D together feed the mouse? _____ days
- d) Can the mouse eat burrow A in equal daily portions of 5 seeds? Of 7 seeds? Explain.

Did you know?

A deer mouse weighs only about 20 g — as much as four sugar cubes — yet it stays active all winter. To keep warm, up to a dozen mice squeeze into one nest and huddle together. A mouse can also drop its body temperature for a few hours on very cold days (this is called torpor) and warm up again to go and eat from its seed stores.

Page 3 — Bats in the caves

Bats hibernate in caves. In November, Cave 1 has 60 bats and Cave 2 has 24 bats. Every week, 6 bats fly from Cave 1 to Cave 2, where it is warmer.

Week	0	1	2	3	4	5	6
Cave 1	60						
Cave 2	24						

a) After how many weeks do the two caves hold the same number of bats? _____ weeks.

How many bats are in each cave then? _____

b) How many bats are there altogether? Does this number change from week to week?

c) Write a rule for the number of bats in Cave 1 after w weeks: Cave 1 = _____

Cave 2 = _____

d) After how many weeks would Cave 1 be empty, if the bats kept moving? _____ weeks

e) Now try it with numbers: Cave 1 has 100 bats, Cave 2 has 40 bats, and 5 bats move each week. When are the caves equal? _____

Did you know?

A hibernating little brown bat breathes only about once every 5 minutes, and its heart slows from over 1000 beats a minute (in flight) to about 20. Bats wake up every few weeks, stretch, and sometimes move to a cooler or warmer spot in the cave — that is where the idea for this puzzle comes from. A single bat can live for more than 30 years!

Answer Key (for the teacher)

Level 2

Puzzle 1: acorn M = 2, leaf O = 3, apple U = 6, mushroom S = 9, pumpkin E = 18 → MOUSE (the last equation is a check: $18 \div 6 = 3$).

Puzzle 2: pear B = 4, sunflower A = 7, berry T = 28 → BAT (last equation is a check).

Page 2: Clue 3: D is twice C → $C = 20$, $D = 40$. Clue 1: A is 36 or 45; clue 2: B is odd → $B = 45$, $A = 36$. a) 141 seeds b) $20 \div 4 = 5$ days c) $5 + 10 = 15$ days d) 36 is not divisible by 5 (does not end in 0 or 5) and not by 7 ($7 \times 5 = 35$); no.

Page 3: Cave 1: 60, 54, 48, 42, 36, 30, 24; Cave 2: 24, 30, 36, 42, 48, 54, 60. a) 3 weeks, 42 bats each b) 84, no c) Cave 1 = $60 - 6w$, Cave 2 = $24 + 6w$ d) 10 weeks e) $100 - 5w = 40 + 5w \rightarrow w = 6$ weeks, 70 bats each.