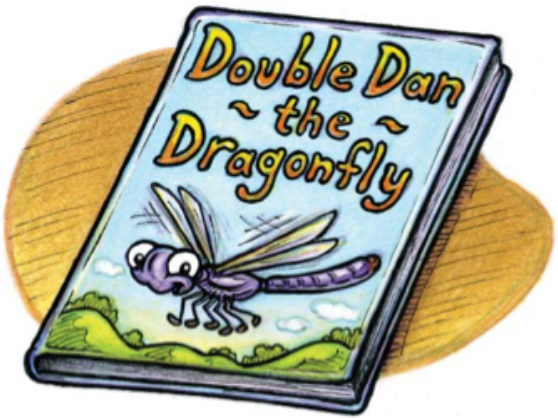
Practice – Using Exponents To Describe Numbers (Part 2)

Apply

15. In a children's story, Double Dan the Dragonfly is growing fast. His body length is doubling every month. At the beginning of the story, his length is 1 cm.



a) Create a table to show how Dan's body length increases every month for ten months.

b) What is his body length five months after the beginning of the story? Express your answer as a power. Then, evaluate.

c) After how many months is his body length more than 50 cm?

16. Arrange the following powers from least to greatest value: 1^{22}, 3^4, 4^3, 2^5, 7^2.

18. Express 9 as a power where the exponent is 2 and the base is

a) positive

b) negative

19. Explain what the following statement means using numerical examples:

Multiplication is a way to represent repeated addition, and powers are a way to represent repeated multiplication.

20. The power 7^3 can be read as "seven cubed." Draw a picture of a cube with a volume of 7^3 cubic units, or 343 cubic units. Label appropriate dimensions for the cube.

Extend

22. Evaluate the powers of 5 from 5^3 to 5^{10}. Use only whole numbers as exponents.

a) What do you notice about the last three digits of each value?

b) Predict the last three digits if you evaluate 5^{46}.

Answer Key

15. a)

Month	Body Length (cm)
Beginning	1
1	2
2	4
3	8
4	16
5	32
6	64
7	128
8	256
9	512
10	1024

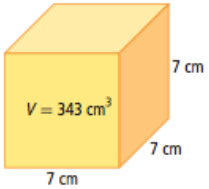
b) $2^5 = 32$ cm **c)** After 6 months.

16. 1^{22}, 2^5, 7^2, 4^3, 3^4

18. a) 3^2 **b)** $(-3)^2$

19. Example: Multiplication is repeated addition. For example, $3 \times 5 = 3 + 3 + 3 + 3 + 3$
$= 15$
Powers are a way to represent repeated multiplication. For example, $3^5 = 3 \times 3 \times 3 \times 3 \times 3$
$= 243$

20.



22.

Exponential Form	Value
5^3	125
5^4	625
5^5	3 125
5^6	15 625
5^7	78 125
5^8	390 625
5^9	1 953 125
5^{10}	9 765 625

a) An even exponent has 625 as its last three digits. An odd exponent has 125 as its last three digits. **b)** 625