Using Exponents to Describe Numbers

1. Write each expression as a power. Then, evaluate.

	Power	Evaluate
a) 6×6	_____	_____
b) $4 \times 4 \times 4$	_____	_____
c) $9 \times 9 \times 9 \times 9 \times 9$	_____	_____
d) $2 \times 2 \times 2 \times 2 \times 2 \times 2$	_____	_____

2. Write each expression as a power. Identify the base and the exponent in each power. Then, evaluate.

	Power	Base	Exponent	Evaluate
a) $5 \times 5 \times 5$	___	___	___	___
b) $1 \times 1 \times 1 \times 1 \times 1 \times 1 \times 1$	___	___	___	___
c) $7 \times 7 \times 7 \times 7 \times 7 \times 7$	___	___	___	___
d) 305	___	___	___	___

3. Write each power as repeated multiplication. Then, evaluate.

	Repeated Multiplication	Evaluate
a) 6^3	_____	_____
b) 2^5	_____	_____
c) 10^6	_____	_____
d) 20^2	_____	_____

4. Write each power as repeated multiplication. Then, evaluate.

	Repeated Multiplication	Evaluate
a) $(-2)^4$	_____	_____
b) -2^4	_____	_____
c) $(-4)^3$	_____	_____
d) -4^3	_____	_____
e) $-(-6)^3$	_____	_____
f) $-(-6)^4$	_____	_____

5. Copy and complete the table.

Repeated Multiplication	Exponential Form	Value
a) (−3) × (−3) × (−3) × (−3)		
b) (−2) × (−2) ×(−2) ×(−2) ×(−2)		
c)	$(-6)^5$	
d)		−125

6. A single bacterium doubles in number every hour. How many bacteria are present after 15 h?

7. Bacteria reproduce by splitting in two. If a single bacteria divides every 20 min, how many bacteria will a single bacteria produce after 8 h?

   a) Write the answer in exponential form.

   b) Calculate the answer.

   c) What assumption did you make to answer the question?

ANSWER KEY:

1. a) 6^2, 36 **b)** 4^3, 64 **c)** 9^5, 59 049 **d)** 2^6, 64
2. a) 5^3, 5, 3, 125 **b)** 1^7, 1, 7, 1 **c)** 7^6, 7, 6, 117 649 **d)** 305^1, 305, 1, 305
3. a) 6 × 6 × 6, 216 **b)** 2 × 2 × 2 × 2 × 2, 32 **c)** 10 × 10 × 10 × 10 × 10 × 10, 1 000 000
   d) 20 × 20, 400
4. a) (−2) × (−2) × (−2) × (−2), 16 **b)** −(2 × 2 × 2 × 2), −16 **c)** (−4) × (−4) × (−4), −64
   d) −(4 × 4 × 4), −64 **e)** −[(−6) × (−6) × (−6)], 216 **f)** −[(−6) × (−6) × (−6) × (−6)], −1296
5. Example:

Repeated Multiplication	Exponential Form	Value
a) (−3) × (−3) × (−3) × (−3)	$(-3)^4$	81
b) (−2) × (−2) ×(−2) ×(−2) ×(−2)	$(-2)^5$	−32
c) (−6) × (−6) × (−6) × (−6) × (−6)	$(-6)^5$	−7776
d) (−5) ×(−5) ×(−5)	$(-5)^3$	−125

6. 2^{15} = 32 768 **7. a)** 2^{24} **b)** 16 777 216 **c)** Example: That no bacteria died.