

Warm up

Fraction

Decimal

$10^{-3}$

$\frac{1}{1,000}$

$0.\underline{001}$

$10^4$

10,000

$10^{-6}$

$\frac{1}{1,000,000}$

$0.\underline{000001}$

$10^0$

1

*Back of P. 2*

Evaluate:

$3^4$

$$\begin{array}{r}
 3 \cdot 3 \cdot 3 \cdot 3 \\
 \vee \quad \quad \vee \\
 9 \cdot 9 \\
 81
 \end{array}$$

$$\begin{array}{r}
 3 \cdot 3 \\
 9 \cdot 3 \\
 27 \cdot 3 \\
 81
 \end{array}$$

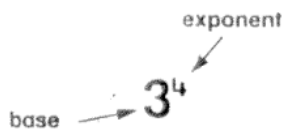
$6^3$

$$\begin{array}{r}
 6 \cdot 6 \cdot 6 \\
 \vee \\
 36 \cdot 6 \\
 216
 \end{array}$$

$$\begin{array}{r}
 36 \\
 \times 6 \\
 \hline
 216
 \end{array}$$

### What is an Exponent?

An exponent shows how many times a number (called the base) is used as a factor.



For example, in the value  $2^4$ , (pronounced two to the fourth power) the exponent 4 tells you how many times the base 2 is multiplied by itself. In this case, the problem becomes  $2 \times 2 \times 2 \times 2$  and the answer is 16.

**Directions:** Use a ruler to draw a straight line between the exponent and its value. A correctly drawn line will cross a number and a letter. The number tells you where to put the letter at the bottom of the page. When you are all done, decode the daffy definition.

|          |   |     |      |     |  |  |  |  |     |      |  |  |  |  |  |  |  |      |      |      |  |  |  |  |         |
|----------|---|-----|------|-----|--|--|--|--|-----|------|--|--|--|--|--|--|--|------|------|------|--|--|--|--|---------|
| $3^2$    | ● |     |      |     |  |  |  |  |     |      |  |  |  |  |  |  |  |      |      |      |  |  |  |  | ● 216   |
| $5^3$    | ● | (S) |      |     |  |  |  |  |     |      |  |  |  |  |  |  |  | (18) | (N)  |      |  |  |  |  | ● 25    |
| $9^2$    | ● | (T) |      |     |  |  |  |  |     |      |  |  |  |  |  |  |  | (5)  |      |      |  |  |  |  | ● 81    |
| $4^3$    | ● |     | (14) | (N) |  |  |  |  |     | (I)  |  |  |  |  |  |  |  | (C)  |      |      |  |  |  |  | ● 243   |
| $5^2$    | ● |     |      |     |  |  |  |  |     | (7)  |  |  |  |  |  |  |  |      | (T)  | (R)  |  |  |  |  | ● 16    |
| $3^5$    | ● | (2) |      |     |  |  |  |  |     |      |  |  |  |  |  |  |  |      |      |      |  |  |  |  | ● 9     |
| $6^3$    | ● |     | (F)  | (9) |  |  |  |  |     |      |  |  |  |  |  |  |  |      |      |      |  |  |  |  | ● 125   |
| $2^4$    | ● |     |      |     |  |  |  |  |     |      |  |  |  |  |  |  |  |      |      |      |  |  |  |  | ● 64    |
| $3^3$    | ● |     |      |     |  |  |  |  |     |      |  |  |  |  |  |  |  |      |      |      |  |  |  |  | ● 5     |
| $7^3$    | ● |     | (16) |     |  |  |  |  |     | (17) |  |  |  |  |  |  |  |      | (E)  |      |  |  |  |  | ● 144   |
| $8^4$    | ● | (N) |      |     |  |  |  |  | (O) |      |  |  |  |  |  |  |  |      | (T)  |      |  |  |  |  | ● 1,024 |
| $5^1$    | ● |     |      |     |  |  |  |  |     |      |  |  |  |  |  |  |  |      | (I)  | (6)  |  |  |  |  | ● 36    |
| $4^5$    | ● |     | (15) |     |  |  |  |  |     |      |  |  |  |  |  |  |  |      |      |      |  |  |  |  | ● 32    |
| $1^{10}$ | ● |     |      |     |  |  |  |  |     |      |  |  |  |  |  |  |  |      |      |      |  |  |  |  | ● 27    |
| $12^2$   | ● |     | (A)  |     |  |  |  |  | (E) | (O)  |  |  |  |  |  |  |  |      | (12) | (T)  |  |  |  |  | ● 4,096 |
| $10^3$   | ● |     |      |     |  |  |  |  |     |      |  |  |  |  |  |  |  |      |      | (4)  |  |  |  |  | ● 343   |
| $6^2$    | ● |     | (8)  |     |  |  |  |  | (E) |      |  |  |  |  |  |  |  |      |      |      |  |  |  |  | ● 1     |
| $2^5$    | ● |     |      |     |  |  |  |  |     |      |  |  |  |  |  |  |  |      |      | (13) |  |  |  |  | ● 1,000 |

**Daffy Definition: Skunk**

s c e n t e r o f A t t e n t i o n

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18

In groups complete the order of operations envelope activity.

On the outside of the envelope is a number. Inside the envelope are numbers and operation symbols. You need to arrange the pieces so that your expression is equal to the number on the envelope. Record your expression on your paper.

$$24 \div (8 + 4^2)$$
$$(8 + 16)$$
$$24 \div 24$$
$$1$$

$$\begin{aligned} & \frac{1}{6} \times (6+18) - 2^2 \\ & \frac{1}{6} \times 24 - 2^2 \\ & \frac{24}{6} - 2^2 \\ & 4 - 4 \\ & 0 \end{aligned}$$

| Name:  |  | Date:   |  |
|--|--|---|--|
| Topic:   |  | Class:  |  |
| Main Ideas/Questions   | Notes/Examples   |   |  |
| Order of Operations  | The order in which you simplify expressions                  |   |  |
|  | P  | parenthesis   |  |
|  | E  | exponents   |  |
|  | M/D  | multiply/divide in order                                  |  |
|  | A/S  | add/subtract in order                                     |  |
| Examples   | Directions: Evaluate each expression.                        |   |  |
|  | 1. $4 - 1 - (6 - 5)$   | 2. $(5 + 4 - 3) \div 6$                                   |  |
|  | $\begin{array}{r} 4 - 1 - 1 \\ 3 - 1 \\ 2 \end{array}$       | $\begin{array}{r} (9 - 3) \\ 6 \div 6 \\ 1 \end{array}$   |  |
|  | 3. $(41 - 9) \div 4(-2)$                                     | 4. $5 \times 6 \div 6 - 6$                                |  |
|  | $\begin{array}{r} 32 \div 4(-2) \\ 8(-2) \\ -16 \end{array}$ | $\begin{array}{r} 30 + 6 - 6 \\ 36 - 6 \\ 30 \end{array}$ |  |
|  | 5. $(13 - (6 - 5)) \div 4$                                   | 6. $6 \times 10 \div (3 \times 2)$                        |  |
| $\begin{array}{r} (13 - 1) \div 4 \\ 12 \div 4 \\ 3 \end{array}$ | $\begin{array}{r} 60 \div 6 \\ 10 \end{array}$               |   |  |

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|  |   |   |
|--|---|---|
|  | 7. $(3^2 \times 2) \div 3$  | 8. $4 + 4^2 \div 2$                                 |
|  | 9. $2^2(19 - 2 \times 4)$   | 10. $(11 - (2 + 3)) \div 6$                         |
|  | 11. $(-6) - 7 + 6 \times 10$  | 12. $(-10) - (-6)^2 + 3^2$                          |
|  | 13. $(1 - 3)^2 + (4^3 - 15)$  | 14. $(-3) \times 4(-4 \times 2)$                    |
| $\begin{array}{r} 416 \\ \times 7 \\ \hline 112 \end{array}$ | $\begin{array}{l} 2 \cdot 2 \cdot 2 \cdot 2 \\ 15. \frac{-7 \cdot 2^4}{18 - 12 + 3} - (-2) \\ \begin{array}{r} -7 \cdot 16 \\ -112 \\ 18 - 4 \\ 14 \end{array} \end{array}$ | $\begin{array}{l} 314 \\ \frac{8}{112} \end{array}$ |
|  | $\begin{array}{l} \frac{-112}{14} \cdot (-2) \\ -8 + 2 \\ \textcircled{-6} \end{array}$   | $\frac{19 - 8 + 4}{5 - 2^2}$                        |

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