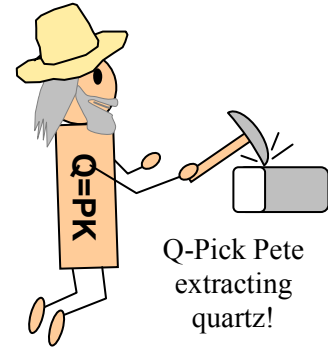
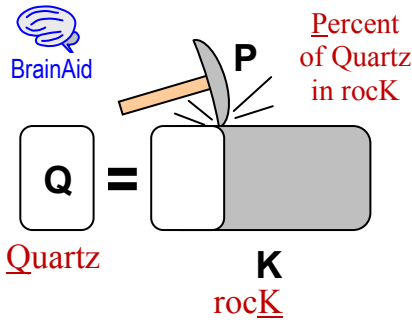


Percent-Of Problems: Q=PK [kyu-pik]

This is what percent of that?

Quantity = Percent • Kwantity

- Kwantity is purposely misspelled to differentiate it from Quantity.
- **P** can be expressed in equivalent percent, decimal, or fraction form, e.g., 25% = .25 = 1/4

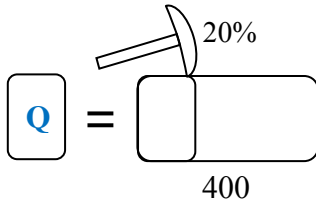


Q=PK Variations

Given two values, find the missing one.

Find Q

What is 20% of 400?



$$Q = P K$$

$$Q = 20\% (400)$$

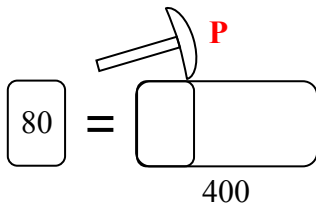
$$Q = \frac{20}{100} (400)$$

$$Q = 80$$

See Fraction Fun techniques
↓ ↓
Pound the Percent

Find P

80 is what percent of 400?



$$Q = P K$$

$$80 = P (400)$$

$$\frac{80}{400} = \frac{P}{400}$$

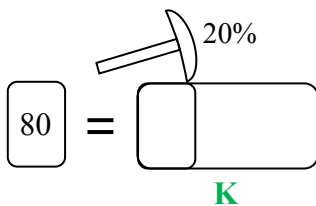
$$200 = P$$

$$20\% = P$$

Division Diet
Heave the Hundredth

Find K

80 is 20% of what?



$$Q = P K$$

$$80 = 20\% K$$

$$\frac{80.0}{20} = \frac{.2}{.2} K$$

$$400 = K$$

Double DiP left
Drag the Dumbbell

Your Turn!



Tips

- Start with Q=PK.
- Plug in the given values.
- "is" means "equal."
- rockK follows "of."
- Solve for the "what."

What is 10% of 300?

$$Q = PK$$

30 is what percent of 300?

30 is 10% of what?

Answers
Q=10%(300),Q=30 30=P(300),P=10% 30=10%K,K=300



The wording of *Percent-Of* problems will *not* always be in Q=PK order. Because the English language is so flexible, there are a dizzying number of ways to word Q=PK problems. Six possible orders of Q-P-K each asking for Q, P, or K produce 18 different wordings!



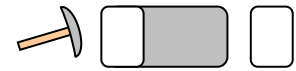
Quartz Pick Rock (QPK)

- Q:** What is 10% of 100?
- P:** 10 is what percent of 100?
- K:** 10 is 10% of what amount?



Quartz Rock Pick (QKP)

- Q:** What amount of 100 is 10%?
- P:** 10 of 100 is what percent?
- K:** 10 of what amount is 10%?



Pick Rock Quartz (PKQ)

- Q:** 10% of 100 is what amount?
- P:** What percent of 100 is 10?
- K:** 10% of what amount is 10?



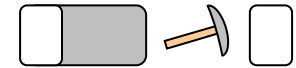
Pick Quartz Rock (PQK)

- Q:** 10% is what amount of 100?
- P:** What percent is 10 of 100?
- K:** 10% is 10 of what amount?



Rock Quartz Pick (KQP)

- Q:** Of 100, what amount is 10%?
- P:** Of 100, 10 is what percent?
- K:** Of what does 10 make 10%?



Rock Pick Quartz (KPQ)

- Q:** Of 100, 10% is what amount?
- P:** Of 100, what percent is 10?
- K:** Of what does 10% make 10?



No matter the word order, start with Q=PK and transfer the numbers in the problem to the appropriate variable.

Of 100, 10 is what percent?

$$Q = P K$$

$$10 = P(100)$$

Your Turn!



15% is what amount of 300?

What percent of 300 is 45?

Of what does 15% make 45?

25 is 20% of what?

What amount of 125 is 20%?

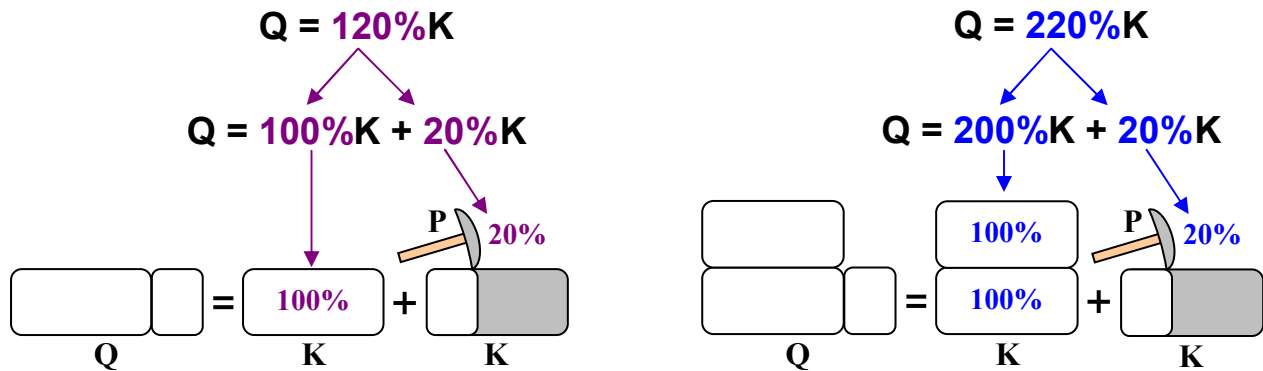
Of 125, 25 is what percent?

Answers: Q=15%(300),Q=45 45=P(300),P=15% 45=15%K,K=300 25=20%K,K=125 Q=20%(125),Q=25 25=P(125),P=20%

If Percent > 100%

$$Q = K + PK$$

Since $100\% = 1$, every multiple of 100% is equivalent to having one 100% solid-quartz rock. Any remaining percent of quartz must be extracted from an additional rock.



Even though you end up with *more* than the original rock, the solution procedures are the same. Use the *Fraction Fun* technique (Pound the Percent, Heave the Hundredth, Double DiP etc.) you prefer.

What is 120% of 400?

$$Q = 120\% (400)$$

$$Q = \frac{120}{100} (400)$$

$$Q = \textcircled{480}$$

480 is what percent of 400?

$$480 = P (400)$$

$$\textcircled{4} \frac{480}{400} = P \frac{(\cancel{400})}{\cancel{400}}$$

$$\textcircled{120\%} = P$$

480 is 120% of what?

$$480 = 120\% K$$

$$\frac{480\cancel{0}}{1\cancel{2}} = \frac{1\cancel{2}}{1\cancel{2}} K$$

$$\textcircled{400} = K$$

Your Turn!



What is 115% of 300?

345 is what percent of 300?

345 is 115% of what?

Answers: $Q=115\%(300), Q=345$ $345=P(300), P=115\%$ $345=115\%K, K=300$

$Q = K \pm PK$ is the basis for Markup, Discount, and Percent-Change Problems.



Practical Percent-Of Problems



For each problem, start with $Q=PK$, substitute the two given values, and solve for the third.

1. If 3 of 4 birds in a flock of 160 birds are female, how many are female?

* [whole of whole = whole / whole] so 3 of 4 = $\frac{3}{4}$

* [part of whole = part • whole] so $\frac{3}{4}$ of 160 = $\frac{3}{4} \cdot 160$

2. Jack has 200 DVDs separated into classical, rock, and pop categories. If 50 of the DVDs are pop, what percent does this represent?

3. Cindy bought a TV and the 10% sales tax came to \$30. What was the original price of the TV?

4. Last year, Sue earned \$500 selling T-shirts. This year she earned 200% of last year's total. What did she earn this year?

5. Make up three $Q=PK$ problems, each one requesting a different variable. Then solve each problem.

Q Problem

P Problem

K Problem

Answers: [1] $Q=\frac{3}{4}(160)$, $Q=120$ [2] $50=P(200)$, $P=25\%$ [3] $30=10\%K$, $K=300$ [4] $Q=200\%(500)$, $Q=1000$ [5] Your choice