1. The ratio of red game pieces to black game pieces is 3 to 2. Draw and legend representative sets to answer each question:
   (a) If there are 12 red pieces, how many black pieces are there?
   (b) If there are 12 black pieces, how many game pieces are there altogether?
   (c) If there are 10 black pieces, how many more red pieces are there than black?
   (d) If there are 20 game pieces altogether, how many are black pieces?
2. The ratio of red to white to blue flowers in the garden is 2:3:1. Draw and legend representative sets to answer each question:
   (a) If there are 10 red flowers, how many white flowers are there?
   (b) If there are 12 white and blue flowers all together, how many red flowers are there?
   (c) If there are 12 more white than blue flowers, how many flowers are there all together?
   (d) If there are 24 flowers, how many are red?
3. Draw and meaningfully legend representative sets to answer each question:
   (a) On the field trip, there are 3 adults for every 20 children. Of the adults, there are half as many men as women. If there are 6 women on the field trip, how many children are there?
   (b) In the situation above, how many people are on the field trip altogether?
   (c) Travis spends half his income on rent. He saves 1/5 of the rest. If he spent \$450 on rent this month, how much did he save?
   (d) Three out of every 5 people who try out for We've Got Talent will be rejected. Of those who are accepted, 1 in every 10 will be interviewed by the host. If 100 people try out, how many will be interviewed?

1. (a) $R = 1$ red piece, $B = 1$ black piece: (draw until we have 12 R)

$$\begin{array}{ccc|cc} R & R & R & B & B \\ R & R & R & B & B \\ R & R & R & B & B \\ R & R & R & B & B \end{array}$$

There are 8 black pieces.

(b) $R = 1$ red piece, $B = 1$ black piece: (draw until we have 12 B)

$$\begin{array}{ccc|cc} R & R & R & B & B \\ R & R & R & B & B \\ R & R & R & B & B \\ R & R & R & B & B \\ R & R & R & B & B \\ R & R & R & B & B \end{array}$$

There are 30 game pieces altogether.

(c) $R = 1$ red piece, $B = 1$ black piece: (draw until we have 10 B)

$$\begin{array}{ccc|cc} R & R & R & B & B \\ R & R & R & B & B \\ R & R & R & B & B \\ R & R & R & B & B \\ R & R & R & B & B \end{array}$$

There are 5 more red pieces than black.

(d) $R = 1$ red piece, $B = 1$ black piece: (draw until we have 20 pieces)

$$\begin{array}{ccc|cc} R & R & R & B & B \\ R & R & R & B & B \\ R & R & R & B & B \\ R & R & R & B & B \end{array}$$

There are 8 black pieces.

2. (a) $R = 1$ red flower, $W = 1$ white flower, $B = 1$ blue flower: (draw until we have 10 R)

$$\begin{array}{cc|ccc|c} R & R & W & W & W & B \\ R & R & W & W & W & B \\ R & R & W & W & W & B \\ R & R & W & W & W & B \\ R & R & W & W & W & B \end{array}$$

There are 15 white flowers.

(b) $R = 1$ red flower, $W = 1$ white flower, $B = 1$ blue flower: (draw until we have 12 W and B altogether)

$$\begin{array}{cc|ccc|c} R & R & W & W & W & B \\ R & R & W & W & W & B \\ R & R & W & W & W & B \end{array}$$

There are 6 red flowers.

(c) $R = 1$ red flower, $W = 1$ white flower, $B = 1$ blue flower: (draw until we have 12 more W than B)

$$\begin{array}{ccccccc} R & R & W & W & W & B \\ R & R & W & W & W & B \\ R & R & W & W & W & B \\ R & R & W & W & W & B \\ R & R & W & W & W & B \\ R & R & W & W & W & B \end{array}$$

There are 36 flowers.

(d) $R = 1$ red flower, $W = 1$ white flower, $B = 1$ blue flower: (draw until we have 24 flowers)

$$\begin{array}{cccccc} R & R & W & W & W & B \\ R & R & W & W & W & B \\ R & R & W & W & W & B \\ R & R & W & W & W & B \end{array}$$

There are 8 red flowers.

3. (a) Don't make C worth 1 child! That will take forever to draw!

$AM = 1$ adult man, $AW = 1$ adult woman, $C = 10$ children: (draw until we have 6 AW)

$$\begin{array}{ccccc} AW & AW & AM & C & C \\ AW & AW & AM & C & C \\ AW & AW & AM & C & C \end{array}$$

There are $6 \times 10 = 60$ children.

(b) There are 60 kids plus 9 adults, so 69 people altogether.

(c) Don't make \$ worth 1 dollar! That will take forever! $R\$ = 10$ rent dollars, $S\$ = 10$ saved dollars, $Un\$ = 10$ unsaved dollars (Draw until we have 40 R.)

$$\begin{array}{cccccccccc} R\$ & R\$ & R\$ & R\$ & R\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \\ R\$ & R\$ & R\$ & R\$ & R\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \\ R\$ & R\$ & R\$ & R\$ & R\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \\ R\$ & R\$ & R\$ & R\$ & R\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \\ R\$ & R\$ & R\$ & R\$ & R\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \\ R\$ & R\$ & R\$ & R\$ & R\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \\ R\$ & R\$ & R\$ & R\$ & R\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \\ R\$ & R\$ & R\$ & R\$ & R\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \end{array}$$

You could also have a non-uniform legend, like $r\$ = 50$ rent dollars, but $S\$$ and $Un\$$ as above, to make the picture smaller and faster to draw:

$$\begin{array}{cccccc} r\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \\ r\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \\ r\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \\ r\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \\ r\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \\ r\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \\ r\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \\ r\$ & S\$ & Un\$ & Un\$ & Un\$ & Un\$ \end{array}$$

Either way, he saved \$80.

(d) You can get creative here, and have two pictures, just don't make R and A equal 1 person each! For instance, R =10 rejected people, $A = 10$ accepted people (draw until we have 100 people)

$$\begin{array}{ccccc} R & R & R & A & A \\ R & R & R & A & A \end{array}$$

Then also break each A down **afterward** into $i = 1$ interviewed person, $n = 1$ uninterviewed person:

$$\begin{array}{ccccccccccccccccccccc} & & & & & (A) & & & & & & & & & & (A) & & & & \\ i & & n & n & n & n & n & n & n & n & & i & & n & n & n & n & n & n & n & n \\ & & & & & (A) & & & & & & & & & & (A) & & & & \\ i & & n & n & n & n & n & n & n & n & & i & & n & n & n & n & n & n & n & n \end{array}$$

There are 4 people interviewed.