

AIM: 5-3 I will be able to compare and order fractions!

Name _____
Mrs. Ashley

Date _____
Math 6

Warm-up:

<p>a) An astronaut who weighs 250 pounds on Earth would weigh $41\frac{1}{2}$ pounds on the moon. What is the astronaut's moon weight written as an improper fraction?</p> $41\frac{1}{2} = \frac{83}{2}$ <p>M.A.D. * + denominator</p>	<p>b) What operations are used to change a <u>mixed number</u> to an <u>improper fraction</u>?</p> <p>a) Multiplication and division b) Division and subtraction c) Division and addition d) Multiplication and addition</p>
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LET'S INVESTIGATE: How do we order and/or compare fractions?

KEY CONCEPT 1: COMPARING FRACTIONS

Least Common Denominator (LCD) - is the least common multiple (LCM) of the denominator of a set of fractions.

Compare the fractions below using < (less than) or > (greater than).

$\frac{17}{6} > 2\frac{1}{4}$

① $2\frac{5}{6} > 2\frac{3}{4}$
 $2\frac{10}{12} > 2\frac{9}{12}$

② ~~$\frac{17}{6} > \frac{9}{4}$~~

What are some ways you can compare the fractions?

① make both mixed numbers
 - LCD
 - over/under $\frac{1}{2}$
 - draw a picture

② make both improper
 - LCD
 - cross multiply ('bowtie') (cross products) butterfly

③ make both decimals

ex: $\frac{5}{7} > \frac{2}{3}$

$\frac{5 \cdot 3}{7 \cdot 3} > \frac{2 \cdot 7}{3 \cdot 7}$
 $\frac{15}{21} > \frac{14}{21}$

KEY CONCEPT 2: ORDERING FRACTIONS

Order from LEAST to GREATEST

$\frac{13}{4}$, $2\frac{3}{8}$, $5\frac{1}{2}$, 3
 \downarrow
 $3\frac{1}{4}$, ~~$2\frac{3}{8}$~~ , $5\frac{1}{2}$, ~~3~~

$2\frac{3}{8}$, 3, $\frac{13}{4}$, $5\frac{1}{2}$

Ways to order fractions:

- Change ALL fractions to either improper fractions or mixed numbers.
- Find the LCD (ladder method)
- OR... *list the multiples*



Now You Try!

1) Compare the fractions below using < (less than) or > (greater than), or = (equal to).
 (HINT: CROSS MULTIPLY)

a) $\frac{21}{4} > 3\frac{2}{3}$

c) $\frac{5}{12} < \frac{13}{22}$
 $< \frac{1}{2}$ $> \frac{1}{2}$

b) ~~$\frac{13}{16} = \frac{39}{48}$~~
 \downarrow
 $\frac{39}{48}$

d) $17\frac{3}{7} > \frac{86}{5}$
 \downarrow
 $17\frac{3 \cdot 5}{7 \cdot 5}$ $17\frac{1 \cdot 7}{5 \cdot 7}$
 $17\frac{15}{35} > 17\frac{7}{35}$

$\frac{86}{5} = 17\frac{16}{5}$
 $17\frac{16}{5} = 17\frac{32}{10}$
 $17\frac{32}{10} = 17\frac{64}{20}$
 $17\frac{64}{20} = 17\frac{128}{40}$
 $17\frac{128}{40} = 17\frac{256}{80}$
 $17\frac{256}{80} = 17\frac{512}{160}$
 $17\frac{512}{160} = 17\frac{1024}{320}$
 $17\frac{1024}{320} = 17\frac{2048}{640}$
 $17\frac{2048}{640} = 17\frac{4096}{1280}$
 $17\frac{4096}{1280} = 17\frac{8192}{2560}$
 $17\frac{8192}{2560} = 17\frac{16384}{5120}$
 $17\frac{16384}{5120} = 17\frac{32768}{10240}$
 $17\frac{32768}{10240} = 17\frac{65536}{20480}$
 $17\frac{65536}{20480} = 17\frac{131072}{40960}$
 $17\frac{131072}{40960} = 17\frac{262144}{81920}$
 $17\frac{262144}{81920} = 17\frac{524288}{163840}$
 $17\frac{524288}{163840} = 17\frac{1048576}{327680}$
 $17\frac{1048576}{327680} = 17\frac{2097152}{655360}$
 $17\frac{2097152}{655360} = 17\frac{4194304}{1310720}$
 $17\frac{4194304}{1310720} = 17\frac{8388608}{2621440}$
 $17\frac{8388608}{2621440} = 17\frac{16777216}{5242880}$
 $17\frac{16777216}{5242880} = 17\frac{33554432}{10485760}$
 $17\frac{33554432}{10485760} = 17\frac{67108864}{20971520}$
 $17\frac{67108864}{20971520} = 17\frac{134217728}{41943040}$
 $17\frac{134217728}{41943040} = 17\frac{268435456}{83886080}$
 $17\frac{268435456}{83886080} = 17\frac{536870912}{167772160}$
 $17\frac{536870912}{167772160} = 17\frac{1073741824}{335544320}$
 $17\frac{1073741824}{335544320} = 17\frac{2147483648}{671088640}$
 $17\frac{2147483648}{671088640} = 17\frac{4294967296}{1342177280}$
 $17\frac{4294967296}{1342177280} = 17\frac{8589934592}{2684354560}$
 $17\frac{8589934592}{2684354560} = 17\frac{17179869184}{5368709120}$
 $17\frac{17179869184}{5368709120} = 17\frac{34359738368}{10737418240}$
 $17\frac{34359738368}{10737418240} = 17\frac{68719476736}{21474836480}$
 $17\frac{68719476736}{21474836480} = 17\frac{137438953472}{42949672960}$
 $17\frac{137438953472}{42949672960} = 17\frac{274877906944}{85899345920}$
 $17\frac{274877906944}{85899345920} = 17\frac{549755813888}{171798691840}$
 $17\frac{549755813888}{171798691840} = 17\frac{1099511627776}{343597383680}$
 $17\frac{1099511627776}{343597383680} = 17\frac{2199023255552}{687194767360}$
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 $17\frac{10141204801825835211973625643008}{31691265004564588029934064107520} = 17\frac{20282409603651670423947251286016}{6338253001141147007483516026880}$
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 $17\frac{81129638414606681695789005144064}{25353012004564588029934064107520} = 17\frac{162259276829213363391578010288128}{50706024009129176059868128215040}$
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 $17\frac{324518553658426726783156020576256}{101412048018258352119736256430080} = 17\frac{649037107316853453566312041152512}{202824096036516704239472512860160}$
 $17\frac{649037107316853453566312041152512}{202824096036516704239472512860160} = 17\frac{1298074214633706907132624082305024}{405648192073033408478945025720320}$
 $17\frac{1298074214633706907132624082305024}{405648192073033408478945025720320} = 17\frac{2596148429267413814265248164610048}{811296384146066816957890051440640}$
 $17\frac{2596148429267413814265248164610048}{811296384146066816957890051440640} = 17\frac{5192296858534827628530496329220096}{1622592768292133633915780102881280}$
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 $17\frac{10384593717069655257060992658440192}{3245185536584267267831560205762560} = 17\frac{20769187434139310514121985316880384}{6490371073168534535663120411525120}$
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 $17\frac{83076749736557242056487941267521536}{25961484292674138142652481646100480} = 17\frac{166153499473114484112975882535043072}{51922968585348276285304963292200960}$
 $17\frac{166153499473114484112975882535043072}{51922968585348276285304963292200960} = 17\frac{332306998946228968225951765070086144}{103845937170696552570609926584401920}$
 $17\frac{332306998946228968225951765070086144}{1038459371706965525$

2) Order the fractions below from LEAST to GREATEST. Remember to find the LCD!

a) $\frac{9}{12}, \frac{5}{6}, \frac{2}{3}$

LCD: 12

$\frac{9}{12} \downarrow$
 $\frac{10}{12} \downarrow$
 $\frac{8}{12} \downarrow$

$\frac{2}{3}, \frac{9}{12}, \frac{5}{6}$

b) $\frac{3}{5}, \frac{2}{4}, \frac{3}{8}$

LCD: 40

$\frac{24}{40} \downarrow$
 $\frac{20}{40} \downarrow$
 $\frac{15}{40} \downarrow$

$\frac{3}{8}, \frac{2}{4}, \frac{3}{5}$

c) $1\frac{9}{20}, 1\frac{1}{2}, 1\frac{1}{3}, 1\frac{1}{5}$

$1\frac{27}{60} \downarrow$
 $1\frac{30}{60} \downarrow$
 $1\frac{20}{60} \downarrow$
 $1\frac{12}{60} \downarrow$

$1\frac{1}{5}, 1\frac{1}{3}, 1\frac{9}{20}, 1\frac{1}{2}$

- 3) A group of friends is collecting food for a food drive. Each person who donates at least $4\frac{1}{4}$ pounds of food receives a free movie ticket. The weight of each person's donation is shown in the table below.

	Quinn	Ted	Andrew	Grace
Weight (lbs.)	$4\frac{3}{10}$	$5\frac{1}{2}$	$\frac{15}{4}$	$4\frac{3}{8}$

$$\hookrightarrow 3\frac{3}{4}$$

- a) Order the weights of the food from greatest to least.

$$T: 5\frac{1}{2}$$

$$G: 4\frac{3}{8}$$

$$Q: 4\frac{3}{10}$$

$$A: \frac{15}{4}$$

- b) Which of the friends will receive a free movie ticket?

Quinn, Ted, Grace

- c) **What if?** Would the person with the smallest donation win a movie ticket if he or she had collected $\frac{1}{2}$ pound more of food? Explain!

$$\begin{aligned} & \text{yes!} \\ & 3\frac{3}{4} + \frac{1}{2} \\ & 3\frac{3}{4} + \frac{2}{4} \\ & 3\frac{5}{4} = 4\frac{1}{4} \checkmark \end{aligned}$$

Write the fraction that represents each color.
Be ready to defend your answer.

