

Longer-is-larger misconceptions

Students who answer as shown on items 1, 2, 3, 4, 5, 8, 9 and 10 have longer-is-larger misconceptions. Learn more about their thinking by observing:

<i>Item 6</i>	Choosing 0.86 indicates decimal point is completely ignored (so $86 > 13$).
<i>Item 7</i>	Using = indicates ignoring leading zeros (as in whole numbers).
<i>Items 11, 12</i>	Do students know these are equal?
<i>Items 13, 14</i>	Some students believe that “decimals” (0.6, 0.00) are smaller than “whole numbers” (such as 0).

1	4.67	4.8	X
2	4.2	4.67	✓
3	0.80	0.8	X
4	0.45	0.450	X
5	0.731	0.73100	X
6	0.86	1.3	?
7	0.8	0.0008	?
8	8.41237	8.41	✓
9	3.77	3.7777	✓
10	2.543	2.5431	✓
11	0	0.0	?
12	3.0	3	?
13	0.6	0	?
14	0.000	0.6	?

Shorter-is-larger misconceptions

Students who answer as shown on items 1 to 10 have shorter-is-larger misconceptions. Learn more about their thinking by observing:

<i>Items 11, 12</i>	Do students know these are equal?
<i>Items 13, 14</i>	Some students believe that “decimals” (0.6 and perhaps 0.00) are smaller than “whole numbers” (such as 0). Other shorter-is-larger students have <i>negative thinking</i> , where they treat all decimals as less than zero and conclude that 0.3 would be greater than 0.4 by analogy with -3 and -4.

1	4.67	4.8	✓
2	4.2	4.67	X
3	0.80	0.8	X
4	0.45	0.450	X
5	0.731	0.73100	X
6	0.86	1.3	✓
7	0.8	0.0008	✓
8	8.41237	8.41	X
9	3.77	3.7777	X
10	2.543	2.5431	X
11	0	0.0	?
12	3.0	3	?
13	0.6	0	?
14	0.000	0.6	?

Apparent-expert behaviour

Students who answer as shown on items 1 to 7 are experts if they can deal with zeros correctly. Learn if they really are experts by observing:

<i>Items 8,9,10</i>	Any = in these items suggests money thinking. Some will mark all three equal. Others will have Item 9 “accidentally” correct by rounding 3.7777 up to 3.78, whilst items 8 and 10 are marked equal.
<i>Items 11, 12</i>	Do students know these are equal?
<i>Items 13, 14</i>	Some students believe that “decimals” (0.6, 0.00) are smaller than “whole numbers” (such as 0).

1	4.67	4.8	✓
2	4.2	4.67	✓
3	0.80	= 0.8	✓
4	0.45	= 0.450	✓
5	0.731	= 0.73100	✓
6	0.86	1.3	✓
7	0.8	0.0008	✓
8	8.41237	8.41	?
9	3.77	3.7777	?
10	2.543	2.5431	?
11	0	0.0	?
12	3.0	3	?
13	0.6	0	?
14	0.000	0.6	?