"Percentage Sliders"

General

This construction allows the user to explore how percentages relate to quantities

Student Specific

See the attached worksheet (next two pages).
Take your time in answering question A1.

Teacher Specific

The sliders can help students see percentages as more than just numbers that are mindlessly manipulated. They also confirm the existence of percentages that are greater than 100.

It's the <u>quality</u> of the answers to the questions that's important, not the speed at which they are answered.

Acknowledgements

Original source of dynamic geometry construction from Mr Wade Ellis, West Valley College, San Jose, California, USA.

Feedback

Do you have any comments on these notes?
Please get in Contact via the website and help improve them further.
All contributors are acknowledged.

HG056 Percentage Sliders Worksheet   Name:_____

Part A – Getting to know the Construction

1. Explore the construction, how it moves and changes and then **explain** how it helps you think about percentages.

   _____

2. What would you have to do to show 20% of 50? And is it more or less than 50?

   _____

3. What would you have to do to show 120% of 50?

   _____

Part B – Using the Construction
Change the units to "books"
Answer each of these questions and **justify** your answer.

4. In a local council, each school loses 20% of their textbooks each year.
   One school had 75 books at the beginning of the year.

a) How many books will that school need to buy at the end of the school year to have 75 books for the next school year?

   _____

b) If that school did not replace the textbooks the second year and lost 20% again would they have lost 40% of the original 75 books?

   _____

c) In another school in the same council, they had 56 books at the end of the year.
   How many books did they have at the beginning of the year?

   _____

5. Change the units to "jeans"
   In a department store, the Men's department had 30 pairs of jeans and loses 10% to theft.
   The Women's department had 50 pairs of jeans and it loses 30% to theft.
   Overall, what was the **percentage** loss in jeans for the store?

   _____

Part C - Generalising

When you answer each of these following questions, you must **justify** your answer.

6. The length of the top bar is **n** centimetres.
    How long does the second bar have to be to show a 100% increase?

    _____

7. Just before we received our allowance, I had £20 and you had £30.
    Each of us received the same allowance.
    Is it possible for me to now have 50% of what you have?
    Explain why **or** why not.

    _____

8. I earn £8/hour and you earn £10/hour and we receive the same percent raise in salary.
    Is it possible for my new salary to be 50% of your new salary? **Explain** why **or** why not.

    _____

9. Y is 30% greater than X.
    Z is 30% smaller than Y.
    Which of the following statements is true **and why**?

    a. X is greater than Z
    b. X is less than Z
    c. X is equal to Z
    d. It depends on the value of X

    _____

Part D – Deep Understanding

10. What's the difference between   a 20% increase, followed by another 20% increase
                                 and   a 40% increase?

    _____

11. What will be the result of a 20% increase followed by a 20% decrease?

    _____

12. If I increase by 100% what will I have to decrease by to get back to the original value?

    _____

13. If I decrease by 20%, what do I have to increase by to get back to the original value?

    _____