Batteries in series and parallel

Build the two circuits shown below:

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| circuit 1bateries-series.jpg | circuit 2bateries-parallel.jpg |

1. Right click on each battery and light bulb and select “show value”.

For circuit 1:

1. Look at the values of current, voltage and resistance. Using Ohm’s Law, calculate the voltage across the light bulb.
2. How does the voltage across the light bulb compare to the voltage given by the two batteries together?
3. Why would you ever you use two batteries connected in series?

For circuit 2:

1. Look at the values of current, voltage and resistance. Using Ohm’s Law, calculate the voltage across the light bulb.
2. How does the voltage across the light bulb compare to the voltage given by the two batteries together?
3. How is the current through the light bulb in circuit 2 compared to the current through the light bulb in circuit 1?
4. Why would you ever use two batteries connected in parallel?
5. In terms of current and voltage provided by batteries connected in series or parallel, when would you use one or the other?
6. Change the voltage of one of the batteries to 1 V instead of 9 V. What happens? Explain why.