Measuring distance

The following questions relate to the presentation, *Measuring distance*. Questions start at slide 3:

1. [slide 3] What makes us think that a particular object is closer to us? (open question)

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2. [slide 5] How was this scale diagram produced in the first place? (open question)

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3. [slide 6] What is different between the two images?

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4. [slide 7] What is different between the two images?

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5. [slide 8] What do the changes in the background tell us about how far away we are from an object?

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Try the parallax activity using your outstretched arm.

6. [slide 10] What do you notice about the position of the soccer ball against its background as the view is alternated between the left and right players? Describe the effect (of parallax).

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7. [slide 11] What do you notice about the effect (of parallax) when the soccer ball is moved further away from the observer?

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8. [slide 12] What is the effect of moving the observers further apart?

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9. How can parallax be used to measure how far away an object is?

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10. [slide 14] How does the distance between observer and object affect parallax?

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11. [slide 15] Why does Mars appear in the same position for both observers?

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12. [slide 16] How can we increase the parallax for very distant objects, such as stars?

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13. [slide 16] How can the measurement of distant stars be further improved?

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14. [slide 19] Why might stars be of different brightness? (open question)

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15. [slide 20] What happens to the brightness of the globe as it is moved further away?

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16. Write down what is meant by absolute brightness and apparent brightness.

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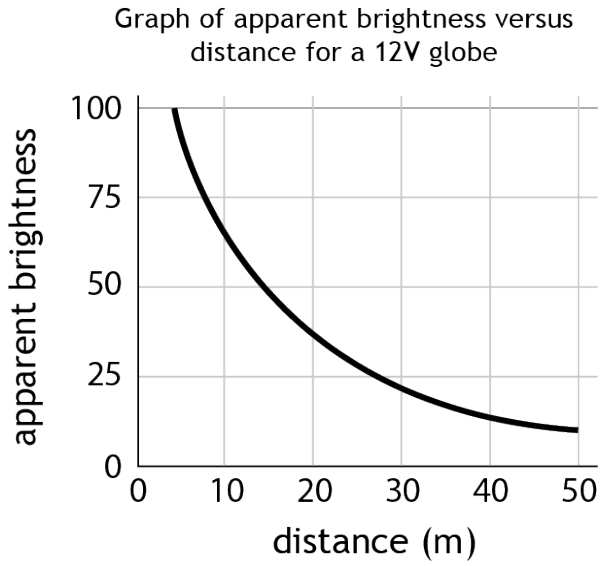

17. Using the graph above, calculate:

the brightness of a globe 30 m from an observer .....

the distance to a globe of observed (or apparent) brightness 40 .....

18. [slide 21] What must we do to compare the absolute brightness of different globes?

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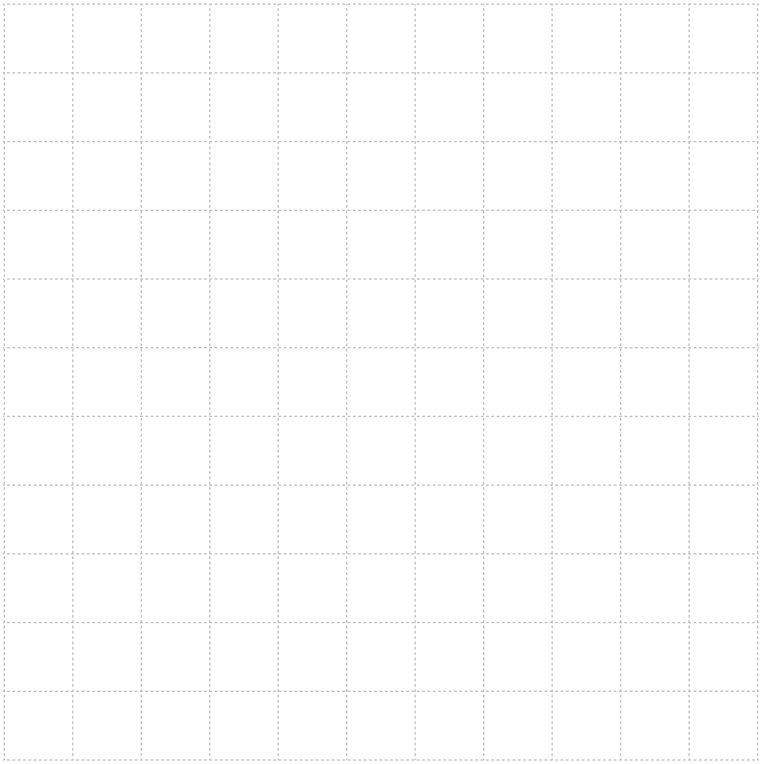
19. [slide 23] Plot values for brightness and distance on the grid below.



20. [slide 23] Is there a simple pattern connecting the brightness of stars to distance from us?

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21. What affects the apparent brightness of a star? (Hint: Think about the globe, and think about the same experiment using different globes.)

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22. If we knew the absolute brightness could we work out the distance from our observations of the apparent brightness?

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23. How might astronomers determine the absolute brightness of distant objects? (open question)

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24. [slide 26] How does this help to measure how far away a Cepheid variable is?

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25. [slide 27] Which of the two stars is closer? How did you work it out?

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26. [slide 29] Why are standard candles so important to astronomers?

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27. [slide 30] Can you guess why this system of measurement is called the 'cosmic distance ladder'?

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