Twinkle, Twinkle, Little Star Lab

Directions:

- Examine the star circles your teacher gives you. Each circle has the following information.
  - **Star name** – the common or catalog name of the star
  - **Temperature** – the temperature of the surface of the star
  - **Color** – the color of a star indicates the temperature of the star.
  - **Brightness** – the number of times brighter the star is than our sun (a fraction means it is dimmer than our sun)
  - **Expected lifetime** – the number of years stars of this type are expected to exist at this color and brightness

- Sort the star circles by temperature.

- Using the graph on the next page, plot the stars on the graph. Use a red pencil for a red star, blue pencil for a blue star and so on.

- Study the graph for trends & then answer the following questions:

  a) Describe the general trend between temperature and brightness.

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  ________________________________________________________________

  b) What is the color and brightness of the most abundant stars? The rarest stars?

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  ________________________________________________________________

  c) What are the characteristics of the stars that do not conform to the graph’s trend?

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  d) In terms of the graph’s trend, is our sun typical or exceptional? ________________

Lab adapted from *Astrobiology: An Integrated Science Approach* from TERC, Cambridge, Massachusetts
e) In the stars that fit the general trend (these are often called **main sequence** stars), what relationship do you notice between color and expected lifetime?

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Read the two articles that were passed out and do a GIST summary on each. (See attached.) Answer the questions at the end of each article on this paper.

**Article: What Is a Star? Q’s**

1. What did our sun look like before it became a star?

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2. Why can nuclear fusion occur in the core of a star?

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3. What do color and brightness indicate about a star?

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4. What is the most common type of star? Why?

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**ARTICLE: What Determines Habitable Zones Around Stars? Q’s**

1. The sun’s habitable zone is sometimes likened to the story in which Goldilocks says the porridge is too hot, too cold, and just right. Which planets fit this Goldilocks analogy?

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Lab adapted from *Astrobiology: An Integrated Science Approach* from TERC, Cambridge, Massachusetts
2. Why can a star have several different habitable zones?
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3. What kinds of stars have either no habitable zones or very inferior ones?
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f) Why might stars of one color be much more abundant than stars of another color?
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g) Which type(s) of star should we consider first when looking for stars that might have life-supporting worlds around them? Why?
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