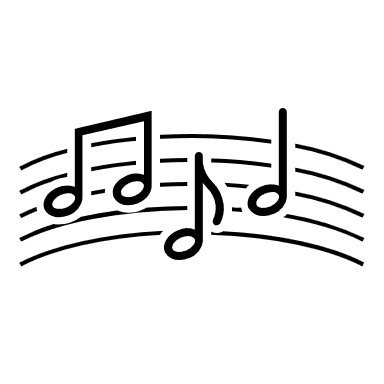
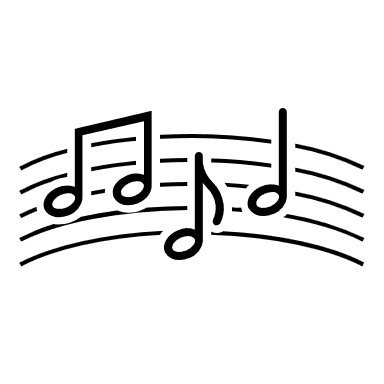
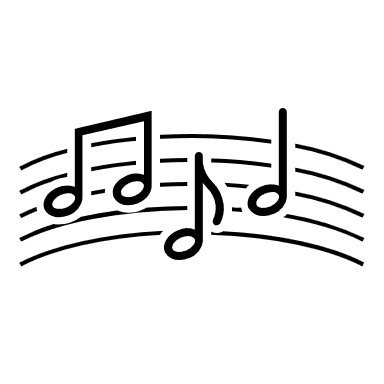
A graph paper with writing on it

Description automatically generated

  
1.  
\*Space odyssey intro song\*  
  
“First there was dust” \*silence\*  
2.  
\*Space odyssey intro song\*  
  
“Then there were stars”  
3.  
\*Space odyssey intro song\*

“Blue stragglers are mysterious stars in star clusters that show different behaviour than the other stars in the cluster”  
4.  
“Let’s say we plot a Hertzsprung-Russel diagram of a cluster of stars of the same age, where we plot out the stars by luminosity and colour. The stars can be seen sitting on a line, all stars on this line have the same age. This is called an isochrone, coming from the words iso, meaning same; and the word chronos meaning time. We can then see that a lot of stars are on a linear line, this is called the main sequence. We can then see that some stars turn off from the main sequence, which are the red giants. However sometimes we encounter stars beyond the turning point.”  
5.  
“Who are these stars? Why do they appear to extend the main sequence? “ These would be the so called blue-stragglers, they appear blue as they can have temperatures hooter than our sun.  
6.  
“To answer this question we need to understand the evolution of stars”

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7.  
Throughout a star’s life, a star burns hydrogen to maintain the balance between the internal pressure of the star and gravity.  
8.  
At the end of star’s life, when all fuel has been exhausted, it’s internal pressure from fusion will decrease so gravity will start compressing the star leading to the core heating up and fusion will start in the outer layers of the star.   
9.  
This will cause rapid expansion of the star.  
10.  
This expansion will lead to a higher luminosity and lower temperature. These changes to stars can be seen in the Hertzsprung-Russel diagram as stars that turn off the main sequence. When talking about a cluster of stars, its isochrone will change and move towards the red giant area as the cluster gets older.  
11.  
Compared to smaller cooler stars, bigger hotter stars tend to live much shorter as they burn through their fuel supply faster. This is why the isochrone bends at the high luminosity- high temperature part. Bigger hotter stars are therefore much more rare in older regions of space.  
12.  
However in some old open clusters like M44 these bigger hotter stars still seem to appear.

A close-up of a graph paper

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13.  
We can see this by looking at the Hertzsprung-Russel diagram of real data of M44 acquired using the telescopes of the Anton Pannekoek Institute. A blue straggler can be seen just of the turning point of the isochrone.  
  
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14.  
  
15.  
  
16.  
  
17.