

The background features a dark blue gradient with a subtle pattern of small white dots. Overlaid on this are several white circular elements: a large scale on the left with markings from 140 to 260, and several smaller circles with arrows indicating clockwise or counter-clockwise rotation. The text 'CER' is centered in a large, bold, light blue font.

CER

{Claim, Evidence, Reasoning

What's the point

- The whole point of CER is to create an explanation to a specific question
- A CER (Claim, Evidence, Reasoning) is a format for writing about science. It allows you to think about your data in an organized, thorough manner.

CLAIM

Claim: a conclusion about a problem.

Answers who, what, where, when and why
(when possible)

- Concise statement (1-2 sentences)
- Relates directly to the question and hypothesis
- Focuses on only the most important features of the experiment or investigation

EVIDENCE

Evidence: scientific data that is appropriate and sufficient to support the claim

- At least one paragraph
- Several data sources used to explain claim, including observations and accurate measurements
- Clear connections to question and hypothesis

REASONING

Reasoning: a justification that shows why the data counts as evidence to support the claim and includes appropriate scientific principles

- At least one paragraph
- Illustrates understanding of how experiment fits into the “big picture”
- Incorporates background knowledge, and makes connections to science concepts studied in class, to draw conclusions about experiment
- Take specific evidence and justify how that evidence connects to the claim

Lets talk about air

- "I'm curious, is it matter? Or something else?"
- Sooooo what's the question here?
- What data do you need to answer the question, and how can you collect that data -- how they can **investigate**

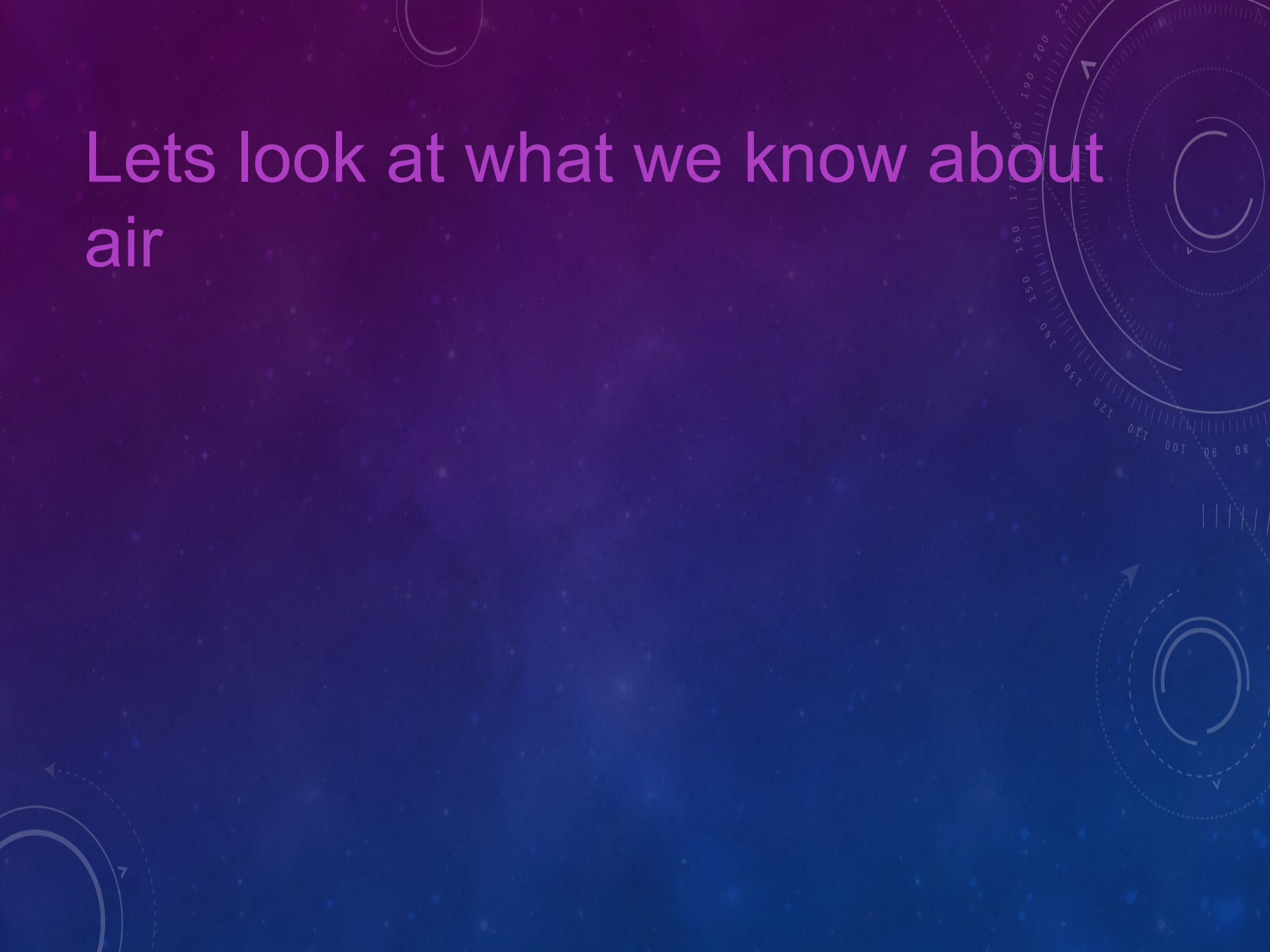
What do you know?

How do you know that?

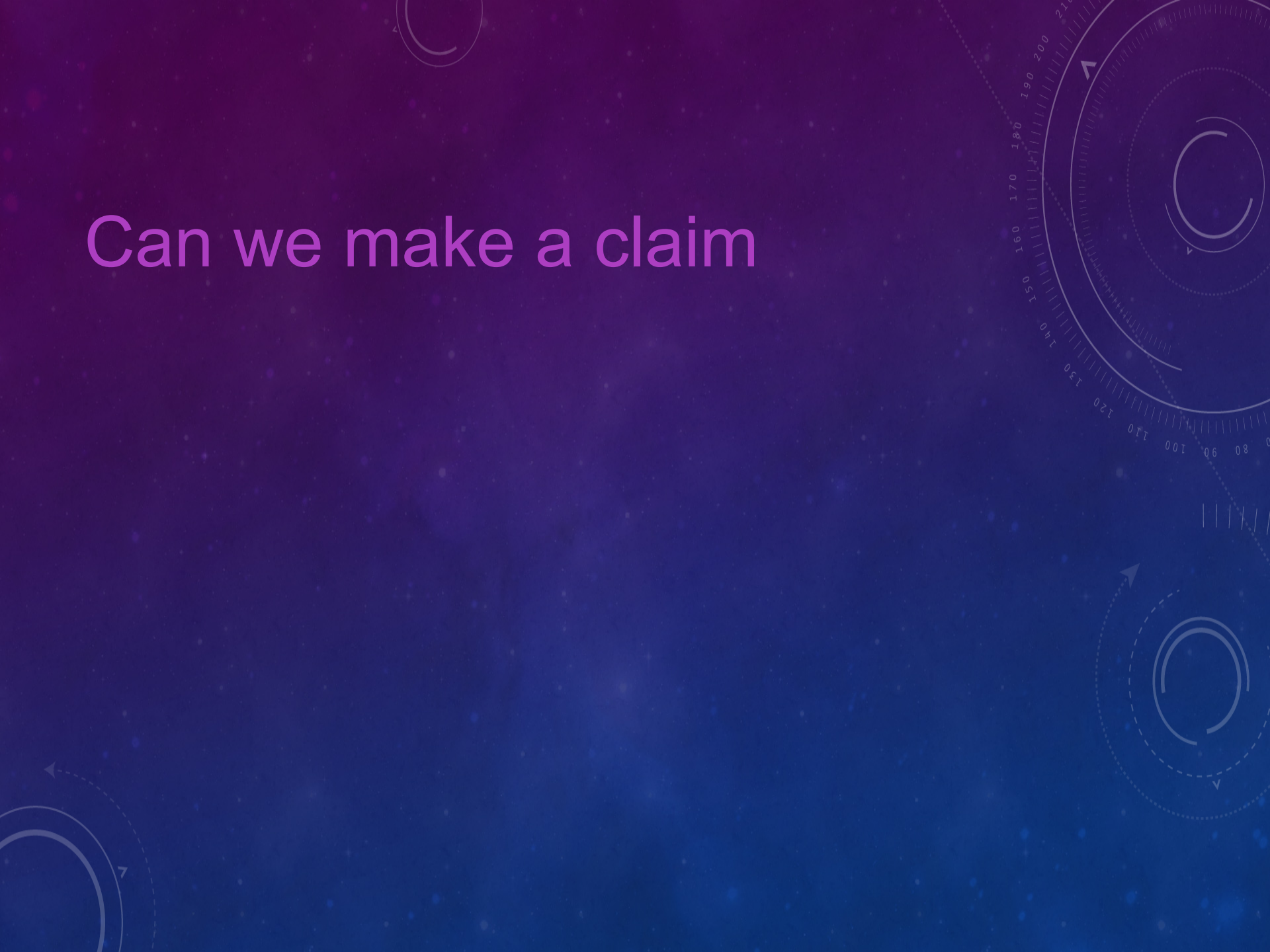
Claim + Evidence
+ Reasoning = Explanation

Why does your evidence
support your claim?

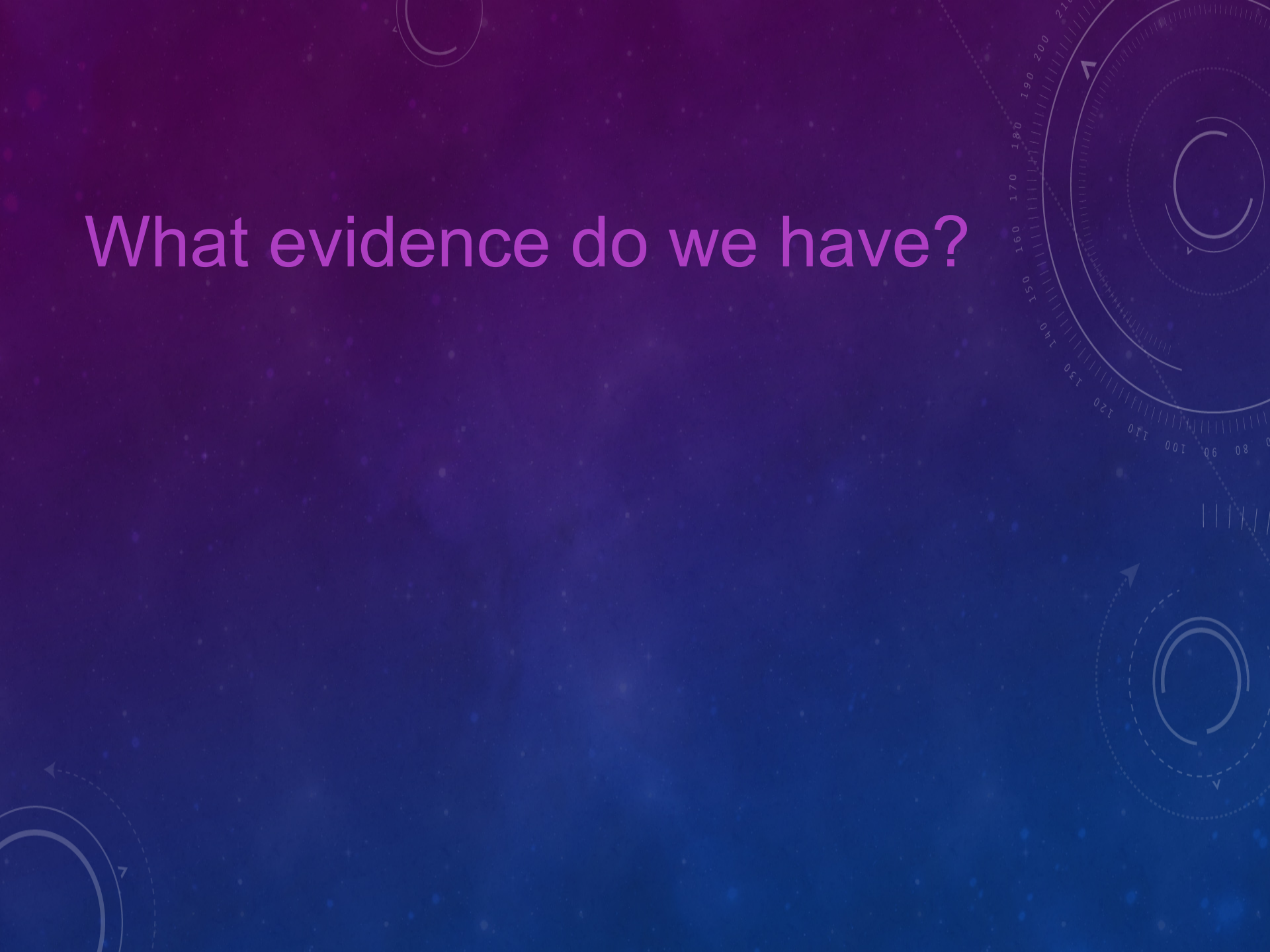
Lets look at what we know about
air

The background features a dark blue gradient with a field of small, light blue stars. Overlaid on this are several technical diagrams in a lighter blue color. On the right side, there is a large circular gauge with a scale from 0 to 210 and a needle pointing towards 180. Below it is a smaller circular diagram with concentric circles and arrows. In the bottom left, there is a dashed circular arrow pointing left. At the top center, there is a partial circular diagram with a curved arrow.

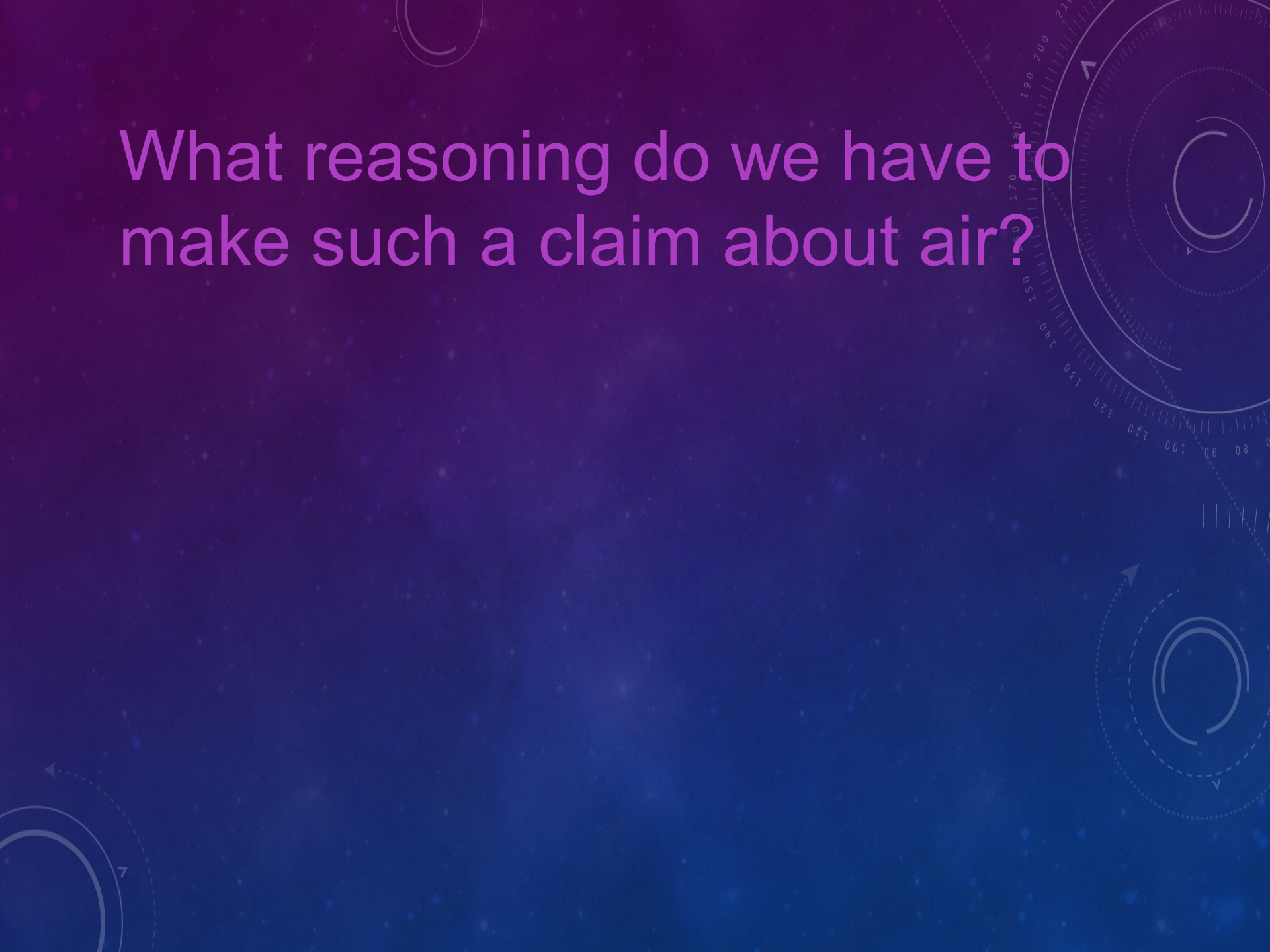
Can we make a claim



What evidence do we have?



What reasoning do we have to make such a claim about air?

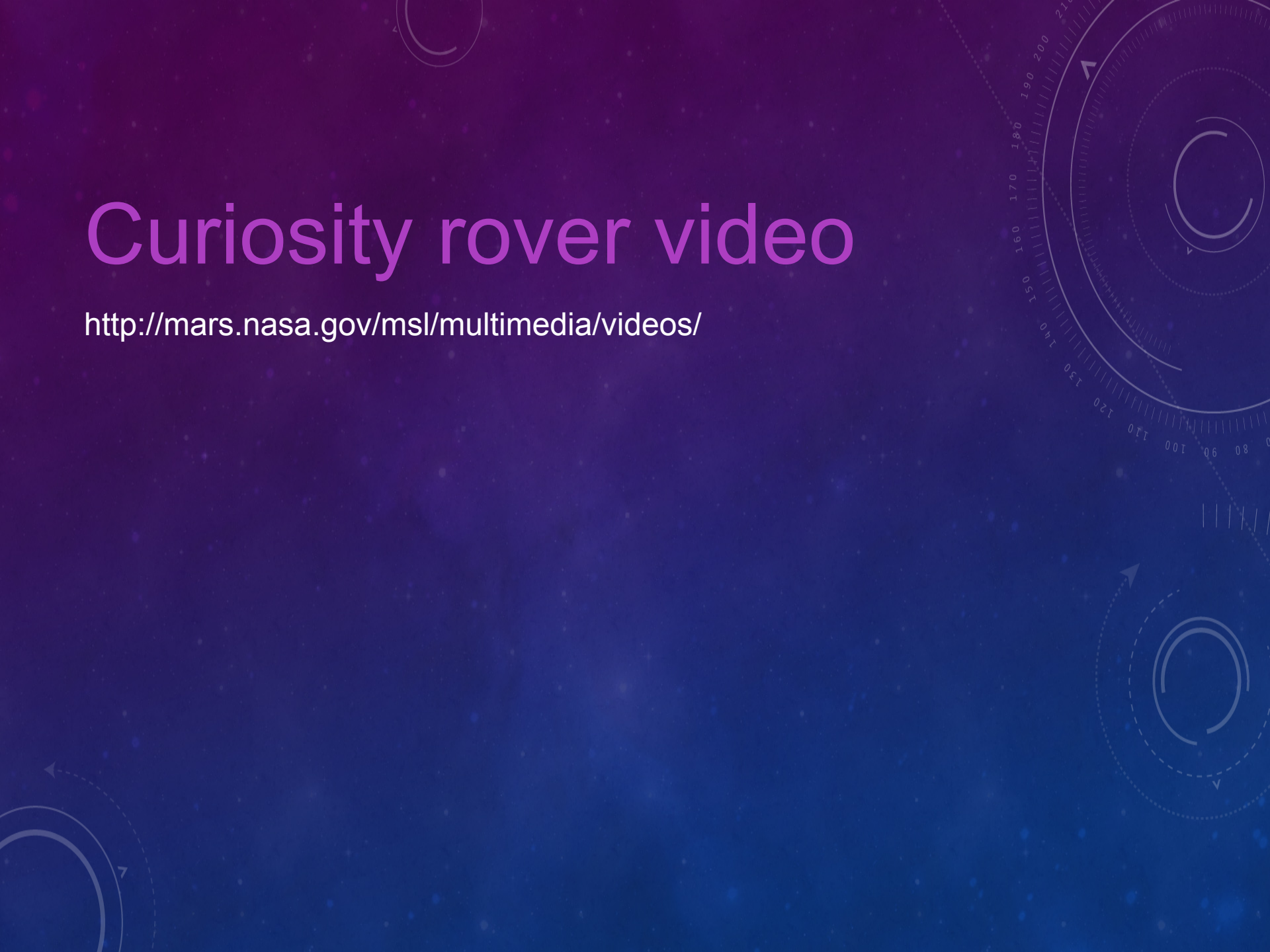
The background features a dark blue gradient with a field of small white stars. Overlaid on this are several technical diagrams. On the right side, there are two circular gauges or dials. The upper one has a scale from 0 to 210 with major markings every 10 units and minor markings every 2 units. The lower one has a scale from 0 to 140 with major markings every 10 units and minor markings every 2 units. Both gauges have dashed lines and arrows indicating a counter-clockwise direction. In the bottom left corner, there is a dashed circular arrow pointing counter-clockwise. At the top center, there is a partial circular diagram with an arrow pointing clockwise.

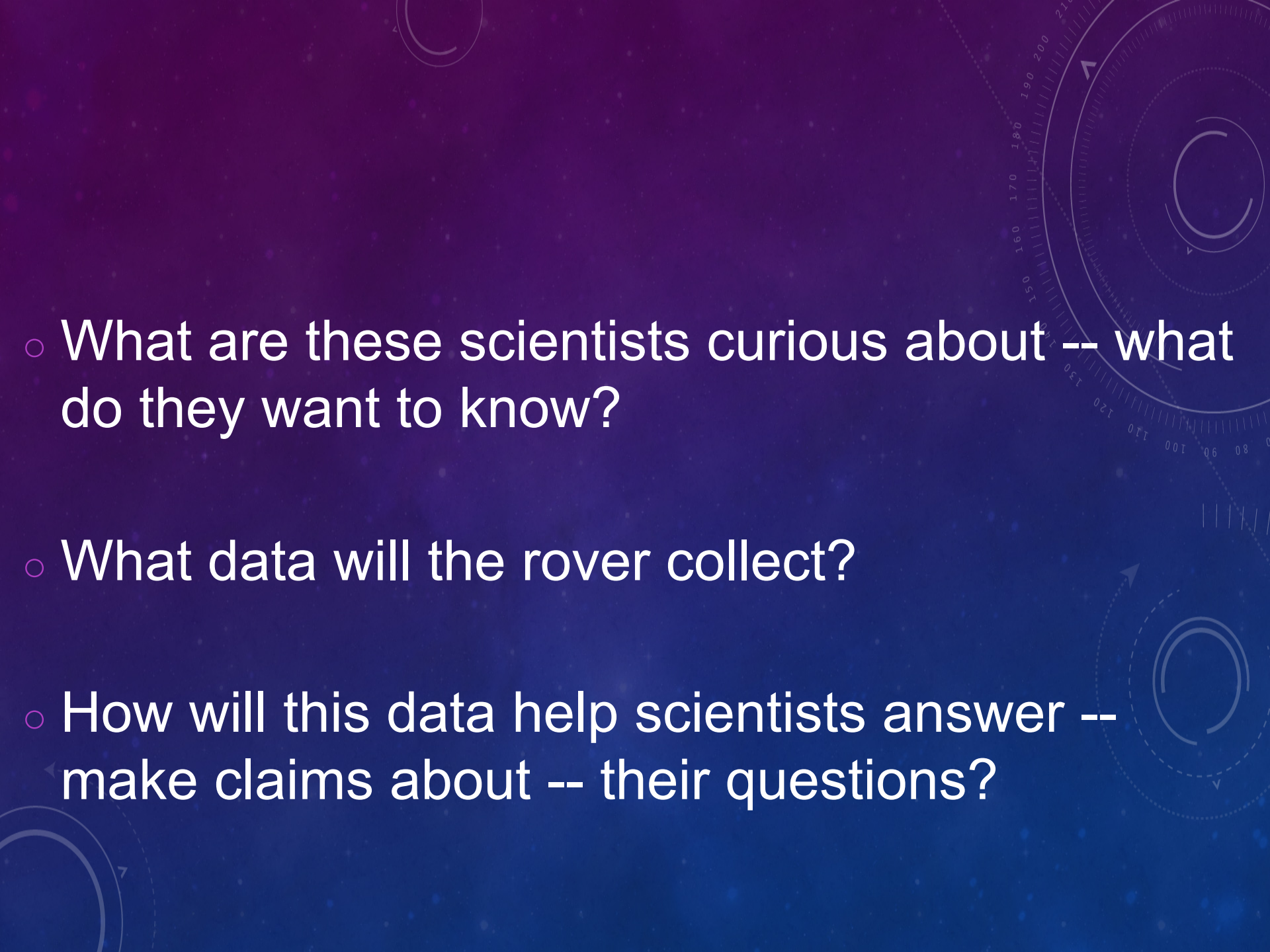
Example CER about air

- *Air is matter* (claim).
- *After investigation, the weight of the ball increases each time more air is pumped into it* (evidence).
- *This shows that air has weight, one of the characteristics of matter* (reasoning).

Curiosity rover video

<http://mars.nasa.gov/msl/multimedia/videos/>



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- The background features a dark blue gradient with a starry space pattern. On the right side, there are several technical diagrams, including a circular scale with numerical markings from 0 to 210 and arrows, and other circular patterns with arrows, suggesting a scientific or engineering context.
- What are these scientists curious about -- what do they want to know?
 - What data will the rover collect?
 - How will this data help scientists answer -- make claims about -- their questions?