

# EXPLAIN

The following is an example in Astronomy. The student has achieved “relational understanding” by explaining a topic.

Explain	Give the meaning of a topic clearly
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## The Question

Explain the meaning of ‘Inverse Square Relationship’



## What students commonly do

- They give a definition of ‘Inverse Square Relationship’ **without giving an explanation.**



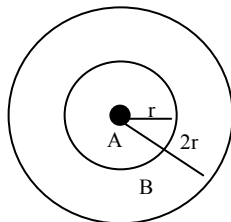
## An example of good work

The answer tells clearly what is meant by ‘Inverse Square Relationship’.

“Inverse Square Relationship means that a certain physical quantity is inversely proportional to the square of another quantity. The equation can be expressed as  $Y \propto 1/r^2$  where Y is intensity and r = distance from the radiating source.

The topic that needs explanation

Definition of the topic



● Radiation source

○ Sphere of different size

The radiation of a radiation source is constant and even in all direction. Its intensity is proportional to the radiation energy over the receiving area. This can be expressed simply as **the radiation intensity has an inverse relationship with the area.** The diagram shows that the intensity would decrease towards the outer zone B, since the surface area of the outer sphere being **zone A+B** is larger than the surface area of the inner sphere (zone A only). Mathematical calculation also shows that the area of a sphere is proportional to the square of its radius ( $r^2$  for inner sphere &  $4r^2$  for outer sphere). So the intensity is inversely proportional to the square of radius ( $1/r^2$  for inner sphere &  $1/4r^2$  for outer sphere) [...]

Explaining the topic by means of the radiation concept

Explaining the relation between intensity & area

Further explaining the topic by means of the concept of surface area