Space - Time Diagram

Apparatus

large space - time diagram (for example that shown below), covered in contact or laminated, with markers to draw on it

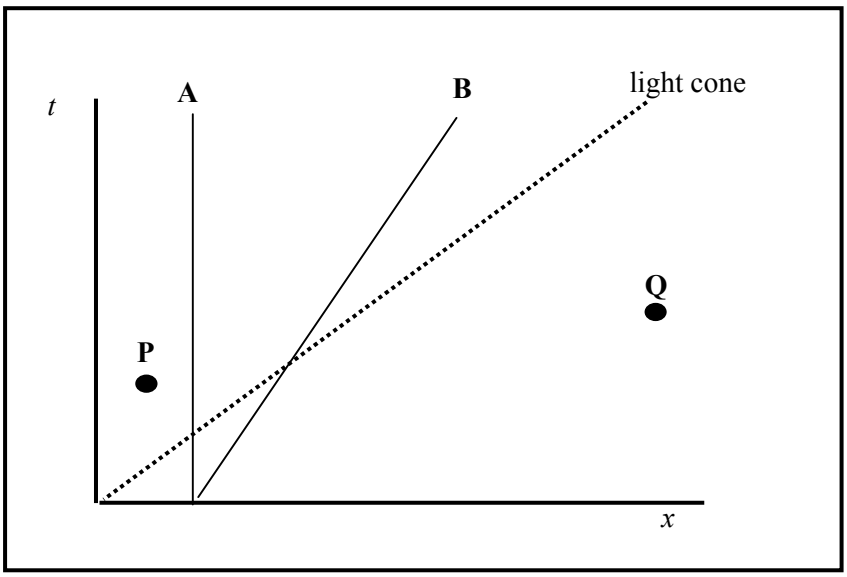
Action

The students identify the paths shown as belonging to moving or stationary objects and identify the light cone. They should recognize that it is not possible to travel faster than the speed of light, hence no path steeper than the light cone is possible.

The Physics

Line A represents an object at rest (relative to the reference frame). Its position is not changing in time. Line B representing an object whose position is changing in time, hence this is a moving object.

It is not possible for any object to move from point P in space-time to point Q, as to do so it would have to travel faster than the speed of light. No path steeper than the light cone is permitted, and it is impossible to move from the left side of the light cone to the right.



Accompanying sheet

Space-Time Diagram

A space-time diagram is useful for showing how things move in time.

How is this diagram different to the displacement diagrams you usually draw?

What does path A represent?
What does path B represent?

Is it possible for an object to go from point P to point Q? Explain your answer.