1) Summary of climate change model and Green house gases;

2) Introduction to kinematics.

Predictions of climate models

Simple model without atmosphere

$T_s^4 = (1-A)\, S / 4\sigma$, ---> $T_s = 255$ K.

—

An improved model with atmosphere

$T_s^4 = (1-A)\, S / 4\sigma + T_e^4 = 2\, T_e^4 = 2\,(1-A)\, S / 4\sigma$

(Assuming $T_e = 255$ K)

Q1

If the surface temperature of the Sun

increases by 10%, then the earth temperature (surface) will

1) increase by 46%;
2) increase by 33%;
3) increase by 21%;
4) Increase by 10%.

Q2

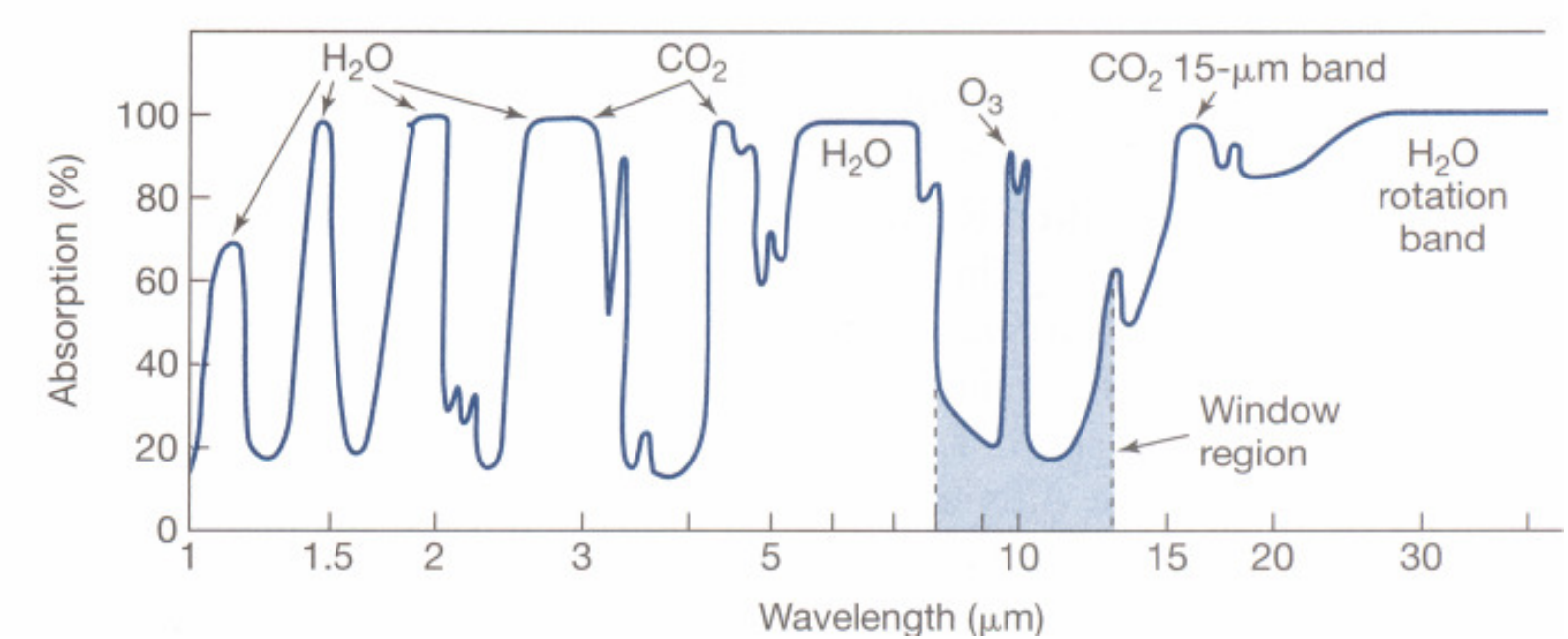
Current earth surface temperature is about 30C. If the distance from the earth to the sun is doubled, the surface temperature of the earth is about

1) 0C;
2) -10 C;
3) - 40C;
4) -120C.

1) Green houses gases like water vapor or carbon dioxide or ozone absorb infrared radiation emitted by the surface of earth, particularly that near the peak of earth radiation and re-emit them.

2) Carbon dioxide emission (increased due to human activities) has an important impact on climate.

A closer look at the infrared region.



Major Constitute of Earth Atmosphere

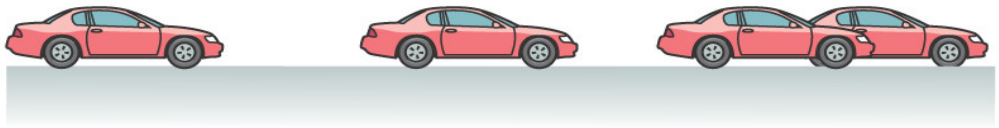
Name	Concentration by vol.	Concentration by ppm
Nitrogen	78	
Oxygen	21	
Water vapor	0.0001 – 4	0.1 -40,000
Carbon dioxide	0.037	370
Ozone,		0.01

Example: Green house gases

Kinematics

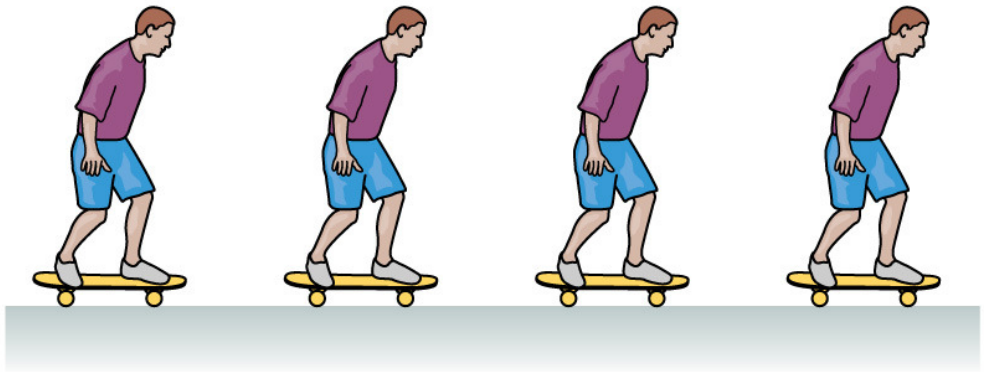
- kinematics describes the motion of an object.
- Translational kinematics is about the position changes with time.
- We describe motion:
  - use motion diagrams
  - use graphs

A



B

C



D

Q1. Which motion diagram shows an object slowing down.

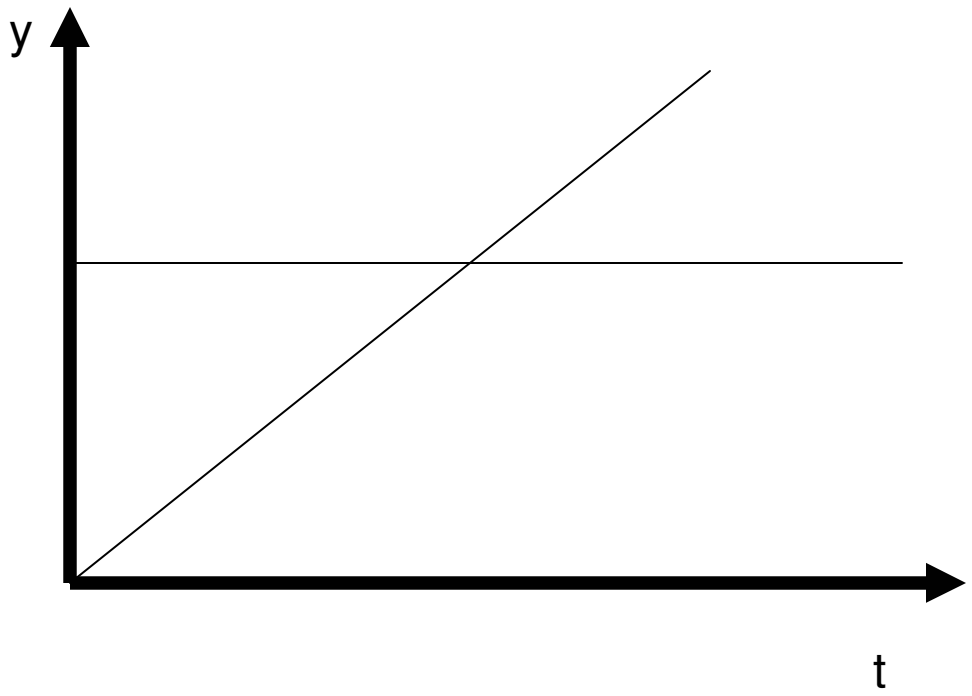
Q2. Which motion diagram shows an object speeding up.

Q3. Which motion diagram shows a stationary object

Q4. Which motion diagram shows an object moving with a constant speed.

Graphs

Position y as a function of time t.



Simulation

- http://www.colorado.edu/physics/phet/web-pages/simulations-base.html