**Mercury**
thin atm; no wind, rain, volcanoes
no scattered light - can see stars in daytime
dusty, cratered - like moon
-300°F to 800°F
0 degree tilt; 88 day orbit
cliffs from shrinking

**Venus**
thick clouds; surface pressure is like being 1 km (0.6 mi) underwater on Earth
carbon dioxide; greenhouse effects - hottest planet (900°F)
no oxygen, no water; textbook: "traditional view of hell"
1972, russians landed Venera 8 on Venus; sent back data for 50 minutes; crushed/melted
morning/evening star; very bright - mistaken for UFO
177 deg tilt; rotates backward - sun rises in West - rotates slowly
one day = 243 E days; one year = 225 E days
phases
mountains, craters, valleys

**Earth, Moon**
23.5 deg tilt; review seasons
moon (3500 km diameter) bigger than pluto (2200 km diameter)

**Mars**
red b/c dust has lots of iron
white polar ice caps, mostly frozen CO2
dried up river beds; hematite - used to be liquid water...
dust storms that cover half the planets; 100mph winds; last weeks/months
"blanket" for planet - increase temps by 60°F
Olympus Mons - 26km high volcano (Everest = 9km); base = size of AZ
Valles Marineris - largest, deepest canyon in solar system; as long as lower 48 states
4000km long, 500km deep (~300 miles)
half of Earth's diameter (mars = 6800 km)
25 deg tilt; ave temp -60°F; ~24 hr day; 1.9 yr orbit

**Asteroid Belt**
chunks or rock and iron; total mass is less than that of the moon
**Jupiter**
great red spot = storm, 2-3 x as big as Earth; 350mph winds; going on for centuries
4 faint rings; ~60 moons (Io, Europa, Ganymede, Callisto)
Galileo spacecraft send probe into atmosphere; transmitted data for 58 minutes
   high pressure and temps...melted; titanium eventually vaporized
3 deg tilt; -234F; 10 hr day; 11.9 year orbit

**Saturn**
Cassini spacecraft saw storm as large as United States; lightning 1000x stronger than on Earth
rings - 5 main rings; billions of tiny ice particles
density = 0.70 g/cc
largest moon, Titan - atm similar to Earth (pressure, composition - nitrogen; no O2), but cold
   water ice and rocks; liquid can exist on surface; surface is geologically young
life on Titan?
95K; 27 deg tilt; 10 hr day; 30 yr orbit

**Uranus**
blue-ish (methane gas)
97 deg tilt - 20-yr seasons of extreme weather
20-30 moons, 11 rings -- when viewed from earth, concentric circles (Not like Saturn's rings)
60K; 17 hr day; 84 yr orbit

**Neptune**
blue-ish (methane gas)
heat escaping from interior, along with rapid rotation (16 hr days), lots of storms; 1500 mph winds
"great dark spot" - just like Jupiter's red spot
Uranus's orbit was weird; Neptune's discovered mathematically
10 moon, 4 rings
16 hr day; 165 yr orbit; 60K; 30 deg tilt

**Pluto**
giant snowball with lots of rock; smaller than our moon
1/1000 the amt of sunlight we get on Earth; sun is same size as Venus is as seen on Earth
inside Neptune's orbit for 20 E yrs during each orbit (doesn't fit in w/ other planets)
   also not in plane of solar system
3 moons, one is half the size of pluto (Charon; "Double planets")
New Horizons launched 2006; get to Pluto 2015; first spacecraft to flyby Pluto, study it and its moons
112 deg tilt; 40K