

Class 6 Science / Chapter 12: Beyond Earth

Curiosity Grade 6 / Notes + Activities ke Jawab / Notes by Abhishek Sir

1. Taare aur Constellations

Raat ko aasmaan me bahut saare taare (stars) dikhte hain. Taare apni khud ki roshni se chamakte hain. Purane samay me log taaron ke samooch ko jodkar jaanwar ya cheez ke aakar jaise patterns maan lete the. Isse taare pehchaanna aasaan hota tha, aur sailors aur yatri disha pata karte the (compass ke aane se bhi pehle).

Constellation

- Taaron ke samooch ka pattern ko constellation kehte the. Aaj ye aasmaan ke tay kiye gaye hisse (regions) ko bhi kehte hain.
- IAU (International Astronomical Union) ne poore aasmaan ko 88 constellations me baanta.
- Lines kalpanik hoti hain, aasmaan me dikhti nahi.

Constellation / Star	Khaas baat
Orion (shikari)	Beech me 3 taare = belt; Taurus (bail) se ladta, peeche Canis Major (kutta)
Sirius	Raat ke aasmaan ka sabse chamakdaar taara, Canis Major me
Betelgeuse (Ardra)	Orion ka taara, Indian naam Ardra nakshatra
Pleiades (Krittika)	Taurus me taaron ka samooch
Aldebaran (Rohini)	Taurus ka taara
Big Dipper	Ursa Major me; Bharat me Saptarishi
Little Dipper	Ursa Minor me
Pole Star (Polaris)	Little Dipper me; Bharat me Dhruva Tara; lagbhag sthir, uttar disha me; uttari golardh me dikhta, dakshin me nahi

Nakshatra: Indian astronomy me kisi taare ya taaron ke samooch ko kehte hain.

2. Raat ko aasmaan dekhna (Night sky watching)

Taare kam kyun dikhte hain?

- *Light pollution* (zyada artificial roshni), dhuān, dhool.
- Oonchi imaarat, ped raasta rokhte hain.
- Gaon aur khule andhere ilaake me zyada taare dikhte hain.
- Hanle (Ladakh) me *Dark Sky Reserve* bana hai.

Taiyari (preparation)

- Bade ke saath khula andhera jagah chuno, roshni aur oonchi imaaraton se door.
- Aise raat chuno jab *Chand* aur *baadal* na ho.
- *Sky Map* / *Stellarium* app, compass, notebook saath lo.
- Aadha ghanta ruko taaki aankhein andhere ki aadat daal lein.
- Akele andhere me mat jao, bade saath ho.

Pole Star kaise dhoondhein? (Activity 12.2)

- Garhi me raat ~9 baje uttar disha me *Big Dipper* dhoondho.
- Uske katore ke aakhiri do taaron ko jodne wali seedhi line uttar ki taraf badhao.
- Un do taaron ki doori ka lagbhag 5 guna aage ek kam chamakdaar taara = *Pole Star*.

Orion aur Sirius (Activity 12.3)

- December se April me shaam ke baad dekho.
- Orion ke beech ke 3 taare ek seedhi line me.
- Un teen taaron se poorv (east) ki taraf line badhao to *Sirius* milega.

3. Hamara Saur Mandal (Solar System)

Surya (Sun) ek taara hai, hamare sabse paas. Wo bahut garam gaison ka gola hai. Prithvi se lagbhag 100 guna bada (diameter me), par bahut door (lagbhag 150 million km) hone se chhota dikhta hai. Doori ko *astronomical unit (au)* me naapte hain (1 au = *Surya-Prithvi* doori). *Surya* ke baad sabse paas ka taara *Proxima Centauri* (~269000 au). Doosre taare bahut door, isliye bindu jaise dikhte hain. Din me *Surya* ki roshni se taare nahi dikhte.

Saur mandal ke sadasya

- *Surya*, 8 planets, unke chand (moons), asteroids, comets aur anya chhoti cheezein.
- *Surya* sabse bada aur bhaari, lagbhag saari urja usse.
- Baaki sab *Surya* ki roshni ko reflect karke chamakte hain.

4. Planets

Planet = bada, lagbhag gol object jo **Surya** ke chakkar lagata hai. **Revolution** = Surya ke charo taraf ghoomna (Prithvi ko lagbhag 1 saal). **Rotation** = apni dhuri par ghoomna (Prithvi ko ~24 ghante = ek din).

Planet (Surya se kram me)	Indian naam	Khaas baat
1. Mercury	Budh	Surya ke sabse paas
2. Venus	Shukra	Morning/Evening star (taara nahi); Chand ke baad sabse chamakdaar; Mercury se zyada garam (atmosphere گرمي rokta hai)
3. Earth	Prithvi	Blue planet (zyadatar paani)
4. Mars	Mangal	Red planet (laal mitti)
5. Jupiter	Brihaspati/Guru	Bahut bada, gas
6. Saturn	Shani	Chhalle (rings)
7. Uranus	-	Gas aur barf
8. Neptune	-	Gas aur barf, sabse door

Trick / Yaad rakhne ka tareeka

• **My Very Easy Method Just Speeds Up Naming:** Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.

Inner aur outer planets

- **Andar ke 4** (Mercury, Venus, Earth, Mars): chhote, thos chattani sateh.
- **Bahar ke 4** (Jupiter, Saturn, Uranus, Neptune): bahut bade, gas aur barf, chhalle (rings) hote hain.
- Jo planet door hai wo aam taur par thanda.
- Pluto ab dwarf planet hai (IAU, 2006).

Planet aur taare me antar: taare bahut jhilmilate (twinkle) hain, planet nahi. Venus ko subah poorv me, shaam ko pashchim me dekha ja sakta hai. **Telescope aur binoculars** se door ki cheezein bade aur chamakdaar dikhti hain.

5. Chand (Moon) aur anya cheezein

Satellite aur Moon

- **Satellite:** jo kisi planet ke charo taraf ghoomte. **Moon** prithvi ka natural satellite hai. Prithvi ka 1 chand, Mars ke 2.
- Chand prithvi ka **chakkar** ~27 din me lagata hai.
- **Doori** ~3,84,000 km. Aakar prithvi ka lagbhag ek chauthai.
- **Wahan** hawa, paani, jeevan **nahi**; sateh par **craters** (asteroids ke takrane se).

Chandrayaan

- Chandrayaan-1 (2008), -2 (2019), -3 (July 2023).
- **23 August 2023:** Vikram lander (Pragyan rover) ne Chand ke south pole ke paas soft landing ki. India aisa karne wala **pehla** desh. Isliye 23 August = **National Space Day**.
- Chandrayaan-4 (planned): Chand se mitti-chattan ke sample lana.

	Asteroid	Comet
Kya hai	Chhoti, chattani, tedhi-medhi cheez	Lambi poonchh wali, dhool, gas, chattan, barf
Kahan	Mostly Mars aur Jupiter ke beech (asteroid belt)	Saur mandal ke bahar se aata
Poonchh kaise?	-	Surya ke paas barf evaporate hoti hai, wahi poonchh
Example	- Teacher	Halley's Comet (har 76 saal, aakhri baar 1986); Sanskrit me Dhumaketu

6. Milky Way aur Universe

Hamara Saur mandal Milky Way Galaxy (Akash Ganga) ka hissa hai. Galaxy = karodon-arabon taaron ka samooch. Universe me bahut saari galaxies hain. Abhi tak kahin aur jeevan ka saboot nahi mila; exoplanets (doosre taaron ke planets) me khoj chal rahi hai.

7. Activities ke Jawab

Q. Activity 12.1 - Taaron ko jodkar pattern banana

Ans. Chamakdaar taaron ko lines se jodo, jo shape bane (patang, ped, jaanwar) uska naam likho. Alag bachchon ke pattern alag honge kyunki sabki kalpana alag hai.

Q. Activity 12.2 - Big Dipper aur Pole Star

Ans. Big Dipper ke katore ke aakhiri do taaron ko jodo, 5 guna aage Pole Star milega. Ye **uttar disha** batata hai.

Q. Activity 12.3 - Orion aur Sirius

Ans. Orion ke beech ke teen taaron ki line east ki taraf badhao to Sirius milega.

Q. Activity 12.4 - Venus

Ans. Subah poorv (east) me surya nikalne se pehle ya shaam ko pashchim (west) me surya ast ke baad dikhta hai.

8. Let us enhance our learning - Answers

Q. Q1. Match

Ans. (i) Prithvi ka satellite - (d) Moon. (ii) Laal graha - (c) Mars. (iii) Constellation - (a) Orion. (iv) Evening star - (b) Venus.

Q. Q2(i). Paheli (riddle)

Ans. M (MAN me hai, CAN me nahi), A (ACE aur FAN dono me), R (RAT me, CAT me nahi), S (SUN me, FUN me nahi). Jawab: **MARS**.

Q. Q2(ii). Apni 2 paheliyan

Ans. 1) "Mera pehla akshar JAR me hai par BAR me nahi, doosra akshar UP aur CUP me hai, ..." Jawab: **JUPITER**. Aap isi tarah apni paheli bana sakte hain: **VENUS** (V-vase me, E-ear me, N-nose me, U-up me, S-sun me).

Q. Q3. Saur mandal ka sadasya nahi hai?

Ans. (i) Sirius (wo ek door ka taara hai).

Q. Q4. Planet nahi hai?

Ans. (ii) Pluto (ab dwarf planet).

Q. Q5. Kaun sa zyada chamakdaar: Pole Star ya Sirius?

Ans. Sirius (Pole Star bahut chamakdaar nahi hai).

Q. Q6. Fig 12.12 me planets ka kram sahi hai?

Ans. Nahi. Sahi kram: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune.

Figure me Earth aur Venus, aur Saturn aur Uranus ki jagah badli hui hai; unhe sahi jagah likho.

Q. Q7. Fig 12.13 - Big Dipper, Little Dipper, Pole Star

Ans. Taaron ko jodkar Big Dipper (7 taare: 4 katora + 3 handle) aur Little Dipper (chhota katora) banao. Little Dipper ke handle ke sire ka taara = Pole Star, jo Big Dipper ke katore ke do aakhiri taaron ki seedhi line se mil jaata hai. Fig. 12.4 se milakar label karo.

Q. Q8. Fig 12.14 - Orion aur Sirius

Ans. Orion ke 3 beech ke taare (belt) jodo, uske upar-neeche ke 4 bade taare (kandhe, pair) jodkar shape banao. Belt ki line ko east ki taraf badhao, wahan sabse chamakdaar taara Sirius hai, label karo.

Q. Q9. Din me taare kyun nahi dikhte?

Ans. Din me Surya bahut chamakdaar hota hai aur uski roshni hawa me phail kar aasmaan ko roshan kar deti hai. Isse door ke kam chamakdaar taare dikhai nahi dete. Subah dheere-dheere ye taare phiki ho jaate hain, shaam ko andhera hone par dikhte hain.

Q. Q10. Big Dipper ko 2-3 ghante ke antar par dekhna

Ans. Haan, Big Dipper Pole Star ke charo taraf ghoomta hua dikhta hai (Prithvi ke ghoomne se). Par Pole Star apni jagah par hi rehta hai. Sketch: har baar (jaise 9, 11, 1 baje) Big Dipper ki jagah Pole Star ke charo taraf ghoom jaati hai.

Q. Q11. Raat ke aasmaan par kavita

Ans. "Raat ke aasmaan me taare jagmagaaye, Chand mama ke saath khel khel ke aaye. Sirius chamka sabse tej, Orion shikari dikhaye apna khel."

9. Important Q&A (exam ke liye)

Q. Constellation kya hai?

Ans. Taaron ka samooch jisse aasmaan ke hisse pehchane jaate hain; 88 constellations hain.

Q. Planet aur star me antar

Ans. Taare apni roshni se chamakte aur jhilmilate hain; planet Surya ki roshni se chamakte, jhilmilate nahi.

Q. Satellite kya hai?

Ans. Jo kisi planet ke charo taraf ghoomte (jaise Chand).

Q. Solar system me kya-kya hai?

Ans. Surya, 8 planets, unke chand, asteroids, comets aur anya chhoti cheezein.

Q. Pole Star kya batata hai?

Ans. Uttar disha (northern hemisphere me).

Chapter ka Naam (copy-paste)

Beyond Earth

– Teacher: Abhishek Sir / MERIT SPRING