

Astronomy in Secondary Schools : From Curriculum to Establishment

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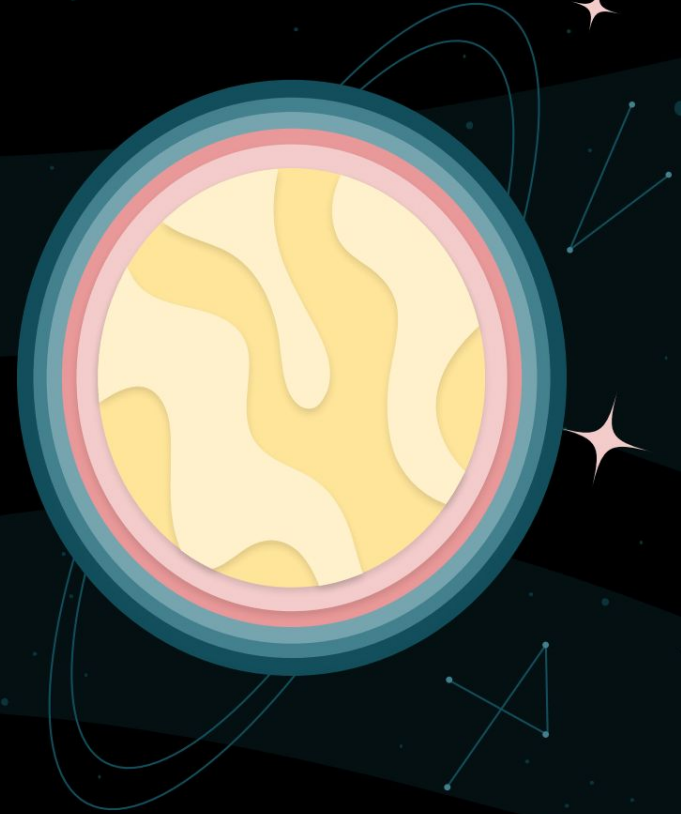
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Designing Curriculum

Cognitive Skill	Curriculum Content	Cognitive Skill	Curriculum Content
Memory	Theory	Decision Making	Calculation based learning
Logical Reasoning	Experiment based learning	Abstract Thinking	Elective based learning
Working Memory	Software based	Cognitive Flexibility	Coupled Learning
Processing Speed	Data analysis and Tutorial	Critical Thinking	Self study units, Tutorials, Data Analysis, Projects and Internship
Visual Perception	Stellarium, NASA SkyView, Documentaries		
Problem Solving	Project, Internship	Spatial Ability	Observational Practicals

Burden Breakdown

- Hour breakdown
- MCQ testing (negative marking included)
- Tutorial as assignments for evaluation

Extended Feature of Syllabus

- Calculus Inclusion
- Syllabus designed at par to be assistive in preparation of International Olympiads
- Syllabus is tempered with segments of Data Analysis and Observational Astronomy for better Olympiad preparations

[Click here to view the syllabus designed by us](#)

NODAL CENTRES



Learning centres

- It comprises of Planetarium and Observatories.
- This centres will be continuously responsible for ensuring smooth conduction of experiments.
- It will contain repository of research by students.
- They will be encouraged to host International Astronomy conferences, initiate discussions regarding enhancements and will communicate it timely with training centres during Phase 02.
- Problems regarding phase implementation will be discussed here.



Training centres

- Reputed institutions facilitating astronomy will provide training to faculty teaching this subject to schools.
- Aimed at training faculty to effectively teach this subject.
- Initiating MoU with foreign country Universities having this course for symbiotic growth.
- They are base for syllabus revision activities, Issuing teacher's handout, and will be nodes for analysing feedback of Phase 03 and henceforth doing forecast.

IMPLEMENTATION I (ECONOMICAL PERSPECTIVE)

Economy Generation

- Subscription model generating revenue of 1.5 Trillion rupees (10,000 Rupees subscription/ year) annually from learning centres.
- This annual economical forecast will be attractive to private institutions for making more learning centres.
- More generation of employment.
- Burst of 4.5 trillion economy in telescope manufacturing and selling field (because its mandatory to have 1 telescope per school).
- School economical upliftment by increasing fee by 5% for class 6th to 9th and 8% for class 10th.
- 56 billion economy generation in phase 1 of implementation (earned by training centres at base charge of 2000 per teacher).

Economical implementation

- Effective implementation using free softwares and free materials.
- Books are economically prized and their copies can be freely accessed through internet.

IMPLEMENTATION II (ESTABLISHMENT OF CURRICULUM)

Classroom enhancements

- MoU between school from India and World (perspective, new teaching methodologies, interactive knowledge based increment).
- **UG/PG symbiotic environment Phases**
- **Phase 01 (3 years):** 1 year teacher training program through universities already having astronomy as a subject. Main focus on teaching subject.
- **Phase 02 (2 years):** teachers of phase 01 will share their feedback and will help in enhancing teaching and training techniques. Revision in trainings. Discussion of phase 01 difficulties and brain-stroming on their solutions.
- **Phase 03 (2 years):** Change in instrumental facilities to teach this subject. Feedback of every teaching organ to be taken. Forecast of future continuation and smoothening to be done based on reports generated.

Quality Assurance

- This are the mandatory standards which has to be followed by schools.
- One telescope per school
- Well facilitated IT lab
- Physics, Maths, and other labs to be well synchronised with coupled learning objective
- Department of Astronomy to be established with atleast 4 teachers.
- Establishing an Astronomy club and getting it registered under Space Institution (like ISRO having opportunity in form of Space tutor).
- Yearly submission and discussion of reports at learning centres.
- Participation at enhancing activities at training centres.
- Encouraging teachers to publish research papers for their personal growth.