

Astronomy, Space, Innovation

(Grade 11, Questions/Answers)

All time values in Book of Problems are indicated as UTC (Coordinated Universal Time)

Grade 11

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Grade 11

Telescope	Planet	Radiation	ESA	Time	Biology	STEM
Astronaut	Sun	Wave	Roscosmos	Period	Geography	
Robot	Comet	Magnetism	JAXA	Angle	Mathematics	
Rocket	Asteroide	Temperature	CNSA	Coordinate	Physics	
Shuttle	Meteorite	Mass	ISRO	Trajectory	Chemistry	
ISS	Earth	Gravity	CNES	Orbit	Informatics	
Cubesat	Asteroide	Atmosphere	DLR	Distance	Biology	
Satellite	Meteorite	Frequency	JAXA	Velocity	Geography	
Rover	Earth	Radiation	CNES	Period	Mathematics	
Probe	Moon	Wave	DLR	Angle	Physics	

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ESA Contract No. 4000115691/15/NL/NDe



A-11.1 – Problem No. 31



Telescope

Planet

Radiation

ESA

Time

Biology

Write short **real space story** dealing with topics presented in the above coloured cells.

Insert **open source picture** in the right side of the text.

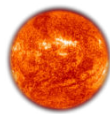
For more information visit this [webpage](#). (*Fill in corresponding hyperlink*).

Question (A):

Write the text of question in bold font.



A-11.2 – Problem No. 32



Astronaut

Sun

Wave

Roscosmos

Period

Geography

Write short **real space story** dealing with topics presented in the above coloured cells.

Insert **open source picture** in the left side of the text.

For more information visit this [webpage](#). (*Fill in corresponding hyperlink*).

Question (A):

Write the text of question in bold font.



A-11.3 – Problem No. 33



Robot

Comet

Magnetism

JAXA

Angle

Mathematics

Write short **real space story** dealing with topics presented in the above coloured cells.

Insert **open source picture** in the right side of the text.

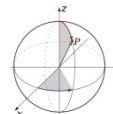
For more information visit this [webpage](#). (Fill in corresponding hyperlink).

Question (A):

Write the text of question in bold font.



A-11.4 – Problem No. 34



Rocket

Asteroid

Temperature

CNSA

Coordinate

Physics

Write short **real space story** dealing with topics presented in the above coloured cells.

Insert **open source picture** in the left side of the text.

For more information visit this [webpage](#). (Fill in corresponding hyperlink).

Question (A):

Write the text of question in bold font.



A-11.5 – Problem No. 35



Shuttle

Meteorite

Mass

ISRO

Trajectory

Chemistry

Write short **real space story** dealing with topics presented in the above coloured cells.

Insert **open source picture** in the right side of the text.

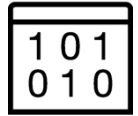
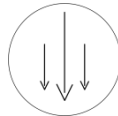
For more information visit this [webpage](#). (Fill in corresponding hyperlink).

Question (A):

Write the text of question in bold font.



A-11.6 – Problem No. 36



ISS

Earth

Gravity

CNES

Orbit

Informatics

Write short **real space story** dealing with topics presented in the above coloured cells.

Insert **open source picture** in the left side of the text.

For more information visit this [webpage](#). (Fill in corresponding hyperlink).

Question (A):

Write the text of question in bold font.



A-11.7 – Problem No. 37



Cubesat

Asteroide

Atmosphere

DLR

Distance

Biology

Write short **real space story** dealing with topics presented in the above coloured cells.

Insert **open source picture** in the right side of the text.

For more information visit this [webpage](#). *(Fill in corresponding hyperlink).*

Question (A):

Write the text of question in bold font.



A-11.8 – Problem No. 38



Satellite

Meteorite

Frequency

JAXA

Velocity

Geography

Write short **real space story** dealing with topics presented in the above coloured cells.

Insert **open source picture** in the left side of the text.

For more information visit this [webpage](#). *(Fill in corresponding hyperlink).*

Question (A):

Write the text of question in bold font.

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A-11.9 – Problem No. 39



Rover	Earth	Radiation	CNES	Period	Mathematics
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Write short **real space story** dealing with topics presented in the above coloured cells.

Insert **open source picture** in the right side of the text.

For more information visit this [webpage](#). (*Fill in corresponding hyperlink*).

Question (A):

Write the text of question in bold font.



A-11.10 – Problem No. 40



Probe	Moon	Wave	DLR	Angle	Physics
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Write short **real space story** dealing with topics presented in the above coloured cells.

Insert **open source picture** in the left side of the text.

For more information visit this [webpage](#). (*Fill in corresponding hyperlink*).

Question (A):

Write the text of question in bold font.

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Space calendar

<http://www.spacecalendar.com> <http://spaceflightnow.com/launch-schedule/>

January 23 (YEAR)

<http://www.astronautix.com/j/january23.html>

Write very brief message about space-related event of this day in history, specify a year.

January 25 (YEAR)

<http://www.astronautix.com/j/january25.html>

Write very brief message about space-related event of this day in history, specify a year.

March 17 (YEAR)

<http://www.astronautix.com/m/march17.html>

Write very brief message about space-related event of this day in history, specify a year.

May 8 (YEAR)

<http://www.astronautix.com/m/may08.html>

Write very brief message about space-related event of this day in history, specify a year.

June 29 (YEAR)

<http://www.astronautix.com/j/june29.html>

Write very brief message about space-related event of this day in history, specify a year.

August 20 (YEAR)

<http://www.astronautix.com/a/august20.html>

Write very brief message about space-related event of this day in history, specify a year.

September 19 (YEAR)

<http://www.astronautix.com/s/september19.html>

Write very brief message about space-related event of this day in history, specify a year.

October 11 (YEAR)

<http://www.astronautix.com/o/october11.html>

Write very brief message about space-related event of this day in history, specify a year.

October 13 (YEAR)

<http://www.astronautix.com/o/october13.html>

Write very brief message about space-related event of this day in history, specify a year.

December 2 (1971)

<http://www.astronautix.com/d/december02.html>

https://en.wikipedia.org/wiki/Mars_3

First ever spacecraft landing on Mars surface.

December 4 (YEAR)

<http://www.astronautix.com/d/december04.html>

Write very brief message about space-related event of this day in history, specify a year.

ANSWERS



Grade 11

A-11.1 (Q)

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Problem solution comment.

Answer: write in the answer.

A-11.2 (Q)

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Problem solution comment.

Answer: write in the answer.

A-11.3 (Q)

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Problem solution comment.

Answer: write in the answer.

A-11.4 (Q)

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Problem solution comment.

Answer: write in the answer.

A-11.5 (Q)

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Problem solution comment.

Answer: write in the answer.

A-11.6 (Q)

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Problem solution comment.

Answer: write in the answer.

A-11.7 (Q)

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Problem solution comment.

Answer: write in the answer.

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A-11.8 (Q)

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Problem solution comment.

Answer: write in the answer.

A-11.9 (Q)

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Problem solution comment.

Answer: write in the answer.

A-11.10 (Q)

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Problem solution comment.

Answer: write in the answer.

INFORMATION SOURCE

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ESA - http://www.esa.int/ESA/Our_Missions

NASA - <https://www.nasa.gov/missions>

DLR - <http://www.dlr.de/dlr/en/desktopdefault.aspx/tabid-10012/#/Missionen/Start/Feature>

JAXA - <http://global.jaxa.jp/projects/>

CNSA - <http://www.cnsa.gov.cn/n6443408/index.html>

CNES - https://cnes.fr/en/fiches_mission_alpha

ISRO - <http://www.isro.gov.in/missions-o>

Roscosmos - <http://en.roscosmos.ru/>

<https://www.nasa.gov/audience/foreducators/topnav/materials/listbytype/Space.Based.Astronomy.html#.VieUP9LhDEY>

https://www.nasa.gov/pdf/58277main_Space.Based.Astronomy.pdf

<http://www.nasa.gov/audience/forstudents/5-8/index.html>

<http://www.nasa.gov/audience/foreducators/stem-on-station/lessons>

http://www.nasa.gov/audience/foreducators/k-4/features/materials_archive_1.html

<http://myasadata.larc.nasa.gov/educators/>

Information on Launch vehicles, Satellites, Space Shuttle and Astronautics:

<http://space.skyrocket.de/index.html>

VOCABULARY

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Telescope

Earth or Space based instrument for observation of remote objects.

Astronaut

Person trained for human spaceflight (as well cosmonaut or taikonaut).

Robot

Mechanical apparatus capable to perform programmed physical tasks in space.

Rocket

Flying space device powered by the reactive force.

Shuttle

Reusable spaceplane for Earth orbiting or human/cargo delivery to ISS.

ISS

Earth's largest artificial satellite - International Space Station.

Cubesat

Earth's artificial cube shaped satellite, dimensions 10×10×10 cm, mass – 1 kg.

Satellite

Artificial object launched by human efforts and orbiting any space body.

Rover

Vehicle designed to explore surface of any space body.

Probe

Automatic spacecraft exploring bodies of Solar system.

Earth

Third planet from the Sun and fifth largest planet of Solar system.

Moon

Earth's natural satellite.

Mars

Fourth planet from the Sun and seventh largest planet of Solar system.

Planet

Space body revolving around a star (including the Sun).

Sun

Earth's closest star.

Comet

Small icy space body (cometoid), when passing close to the Sun displaying coma or tail.

Asteroid

Minor planet (planetoid) orbiting the Sun in elliptical orbit.

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Meteorite

Debris from space object (meteoroid) survived the passage through atmosphere.

Temperature

Object's (space body) warmth.

Mass

Quantity of matter.

Gravity

Interaction between material bodies depending on their mass.

Atmosphere

Gas layer surrounding space body of sufficient mass.

Frequency

Event recurrence per unit of time.

Radiation

Spontaneous decay of atomic nuclei.

Wave

Energy transfer in space and time.

Magnetism

Magnetic interaction occurring between the moving electric charges.

NASA

National Aeronautics and Space Administration – governmental agency of USA.

ESA

European Space Agency – intergovernmental space exploration organisation.

Roscosmos

Roscosmos State Corporation for Space Activities – governmental body of Russia.

JAXA

Japan's National Aero-space Agency - national agency of Japan.

CNSA

China National Space Administration - national agency of China.

ISRO

Indian Space research Organisation – governmental agency of India.

CNES

National Center of Space Research - governmental agency of France.

DLR

German Aerospace Center – national center of Germany.

Time

Duration of object (space body) existence.

Period

Time elapsed for one rotation of object (space body) around its axis or other space body.

Angle

Figure (area) formed by two rays sharing the common endpoint.

Coordinate

Object's (space body) position in plane or space.

Trajectory

Path that moving object (space body) follows through space.

Orbit

Curved path of moving object (space body) around other object (space body).

Distance

Length (interstice) between objects (space body) in plane or space.

Velocity

Completed distance of object (space body) per unit of time.

Mathematics

Science of structures, variations and spatial patterns.

Physics

Science of all forms of matter.

Chemistry

Science of chemical elements and nature of materials.

Informatics

Science of information processing and storage, the use of computers.

Biology

Science of life and living organisms.

Astronomy

Science of celestial objects and processes outside the atmosphere of Earth.

Geography

Science of the lands, the features, the inhabitants and the phenomena of Earth.

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