

WORKSHEET

Title	Scope	Age Group
Space and SDGs	To familiarize with space technology and its applications contributing towards achieving SDGs	Pupils aged 14 – 18
Resource Material	Read and go through document 'Achieving SDGs through Space' available on SEAD website (www.sead.pk) before attempting this worksheet	

Space Technology and its Applications	Identify Relevant Goal
<p>Space technologies can provide, among others:</p> <ul style="list-style-type: none"> • High-speed internet connectivity and tailored online educational content delivered via satellite • Electronic attendance monitoring and provision of incentives for parents to reduce dropout rates • Remote learning, e-learning and lifelong learning opportunities for remote and isolated communities 	
<p>Space technologies play a central role in:</p> <ul style="list-style-type: none"> • Climate change monitoring • Weather forecasting • Disaster management • Search and rescue operations 	

Space technologies are utilised for:

- Urban planning, to pinpoint structures and reference points for cadastral and urban planning purposes
- Smart Cities, through the application of Global Navigation Satellite Systems, Earth Observation and Satellite Telecommunications
- Improvement of city services, such as smart waste management systems
- Air quality monitoring
- Disaster management
- Infrastructure monitoring
- Search and rescue operations

Space technologies are central, among other things, in:

- Forecasting natural disasters and better coordinate subsequent aid provision
- Optimising sustainable utilisation of natural resources
- Providing efficient support to vulnerable populations
- Mapping populated areas and their access to basic services

Space technologies can support women's empowerment through:

- Access to quality education even in remote and isolated communities
- Support for female entrepreneurship, through access to training, soft infrastructure, information and safety in the work environment
- Career development opportunities, often within STEM

<p>Space technologies are essential in a range of health applications, including, but not limited to:</p> <ul style="list-style-type: none"> • Studying disease epidemiology, by enabling increased use of spatial analysis to identify the ecological, environmental and other factors that contribute to the spread of vector-borne diseases, monitoring disease patterns and defining areas that require disease-control planning • Addressing issues related to vision, cognition and disability assistance • Monitoring factors that affect human health and well-being, like air quality and traffic • Supporting health promotion and disease prevention, through the use of wearable monitoring devices • Enabling remote healthcare 	
<p>Space technologies enable:</p> <ul style="list-style-type: none"> • International cooperation initiatives • Exchange of data and information • Open source databases • Sharing of infrastructure and exchange of technical know-how 	
<p>Space technologies enable, among others:</p> <ul style="list-style-type: none"> • Water quality monitoring • Meteorological forecasting • Access to infrastructural support and technical know-how 	
<p>Space technologies can assist with:</p> <ul style="list-style-type: none"> • Natural resources management • Food and dangerous goods traceability • Monitoring of endangered species trafficking and products of human slavery • Smart Agriculture by combining Earth observation, satellite telecommunications and Global Navigation Satellite Systems • Spin-offs of In-situ resources utilization (ISRU), such 3d printing technologies to create structures in orbit, could have applications on Earth 	

<p>Space technologies are pivotal in:</p> <ul style="list-style-type: none"> • Conflict monitoring • Enabling participation of remote and isolated communities in democratic processes • Enforcement of legislation • Access to reliable information 	
<p>Space technologies support:</p> <ul style="list-style-type: none"> • Mapping and monitoring of natural and protected areas • Fishing vessel tracking and navigation • Monitoring of illegal, unregulated and unreported fisheries • Fishery product traceability (endangered species, exploitation of fishery resources) • Assessment and monitoring of marine and coastal resources • Climate change monitoring, particularly water temperature • Identification of algal blooms 	
<p>Space technologies can contribute in various ways, for example through:</p> <ul style="list-style-type: none"> • Connectivity in remote and isolated areas • Remote participation in democratic processes • Reliable access to information • Connectivity in remote and isolated areas • Remote participation in democratic processes • Reliable access to information 	
<p>Space technologies are central in:</p> <ul style="list-style-type: none"> • Critical infrastructure monitoring, particularly with regards to energy networks • Power grid synchronisation • Seismic surveying • Identification of optimal sites for the production of renewable energy • Solar and wind energy production forecasting to estimate the amount of energy that needed from other sources 	



Space technologies support:

- Global economies and GDP growth, contributing to a range of sectors, particularly service delivery, utilities, banking and finance, agriculture and communications
- Lone workers monitoring, establishing safe and secure working environments

Space technologies are key to:

- Optimising crop productivity through informed management process and increased efficiency in the use of existing resources, including land, seeds, fertilisers, plant protection agents and water
- Improving livestock management through enhanced monitoring and identification of suitable grazing

Space technologies can be utilised for:

- Bio-geophysical land surface monitoring
- Terrestrial biodiversity monitoring
- Monitoring of poaching and identification of smuggling routes

Go Goals!

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SPACE AND SDGs

Answer Key

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