Biological Sciences Technician Competency Model

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Biological Sciences Technician Competency Model Study Summary

The DOI Office of Human Capital (OHC) conducted a comprehensive study to identify the critical competencies and tasks for successful performance of biological sciences technician work across the Department. OHC worked with biological sciences technician subject matter experts from across the Department in order to create a thorough and accurate representation of the work performed at DOI and the knowledge, skills, and abilities required to perform that work.

The study involved a variation of OPM's Multipurpose Occupational Systems Analysis Inventory – Closed-Ended (MOSAIC) method for gathering and analyzing information about work. This included a wide-ranging literature review to build lists of tasks and competencies used to describe biological science technician work across the Department. Next, focus groups with DOI biological science technician subject matter experts were held to ensure these lists were complete and accurately represented the job. Trained job analysts also linked competencies to each task to confirm they were required to perform the work. DOI biological science technician employees and their supervisors rated the tasks and competencies to demonstrate the importance and utility of each component of the study. Finally, the resulting competencies were reviewed by subject matter experts to confirm the accuracy of the model.

The results of this study establish a common set of biological science technician tasks and competencies across the Department, which can be used to create assessment and selection techniques and tools and establish common practices and terminology for recruitment, performance management, workforce planning, training, and employee development. This work provides DOI with current, validated information that can be used to ensure its biological science technician workforce has the tools to meet future challenges.

Please reference the Competency Model Interpretive Guidance for assistance in interpreting and applying the results of this study.

Table 1: Competencies for Assessment and Selection by Grade

The following general competencies are valid for assessment and selection, performance management, and other related human capital functions across the biological science technician occupational series included in this study at the grade levels listed below.

GS-4	GS-5	GS-6
• *Accountability* • *Flexibility* • *Integrity/Honesty* • *Interpersonal Skills* • *Learning* • *Physical Strength and Agility* • *Resilience* • *Teamwork*	• Accountability • *Attention to Detail* • Flexibility • Integrity/Honesty • Interpersonal Skills • Learning • Physical Strength and Agility • Resilience • Teamwork	• Accountability • Attention to Detail • Flexibility • Integrity/Honesty • Interpersonal Skills • Learning • *Oral Communication* • Physical Strength and Agility • *Problem Solving* • *Reasoning* • Resilience • Teamwork
GS-7	**GS-8**	**GS-9**
• Accountability • Attention to Detail • *Compliance* • *Creative Thinking* • Flexibility • *Information Management* • Integrity/Honesty • Interpersonal Skills • Learning • Oral Communication • Physical Strength and Agility • Problem Solving • Reasoning • Resilience • *Teaching Others* • Teamwork • *Technical Competence* • *Writing*	• Accountability • Attention to Detail • Compliance • Creative Thinking • *Customer Service* • Flexibility • *Influencing/Negotiating* • Information Management • Integrity/Honesty • Interpersonal Skills • Learning • Oral Communication • *Organizational Awareness* • Physical Strength and Agility • Problem Solving • *Project Management* • Reasoning • Resilience • Teaching Others • Teamwork • Technical Competence • Writing	• Accountability • Attention to Detail • Compliance • Creative Thinking • Customer Service • Flexibility • Influencing/Negotiating • Information Management • Integrity/Honesty • Interpersonal Skills • Learning • Oral Communication • Organizational Awareness • Physical Strength and Agility • Problem Solving • Project Management • Reasoning • Resilience • Teaching Others • Teamwork • Technical Competence • Writing

Table 2: Required Proficiency Levels by Grade Level

Proficiency Level Scale Definitions		
Proficiency Level	**General Competencies**	**Technical Competencies**
5 = Expert	• Applies the competency in exceptionally difficult situations • Serves as a key resource and advises others	• Applies the competency in exceptionally difficult situations • Serves as a key resource and advises others • Demonstrates comprehensive expert understanding of concepts and processes
4 = Advanced	• Applies the competency in considerably difficult situations • Generally requires little or no guidance	• Applies the competency in considerably difficult situations • Generally requires little or no guidance • Demonstrates understanding of concepts and processes
3 = Intermediate	• Applies the competency in difficult situations • Requires occasional guidance	• Applies the competency in difficult situations • Requires occasional guidance • Demonstrates understanding of concepts and processes
2 = Basic	• Applies the competency in somewhat difficult situations • Requires frequent guidance	• Applies the competency in somewhat difficult situations • Requires frequent guidance • Demonstrates familiarity with concepts and processes
1 = Awareness	• Applies the competency in simplest situations • Requires close and extensive guidance	• Applies the competency in simplest situations • Requires close and extensive guidance • Demonstrates awareness of concepts and processes

Required Proficiency Level Ratings by Grade Level - General						
Competency	**GS-4**	**GS-5**	**GS-6**	**GS-7**	**GS-8**	**GS-9**
Accountability	3	3	4	4	5	5
Attention to Detail	2	3	3	4	5	5
Compliance	1	2	2	3	4	4
Creative Thinking	1	2	2	3	3	4
Customer Service	1	1	2	2	3	3
Flexibility	3	3	4	4	5	5
Influencing/Negotiating	1	1	2	2	3	3
Information Management	1	2	2	3	3	4
Integrity/Honesty	4	4	5	5	5	5
Interpersonal Skills	3	3	4	4	5	5
Learning	3	3	4	4	5	5
Oral Communication	2	2	3	3	4	4
Organizational Awareness	1	1	2	2	3	3
Physical Strength and Agility	3	3	3	3	3	3
Problem Solving	2	2	3	3	4	4
Project Management	1	1	2	2	3	3
Reasoning	2	2	3	3	4	4
Resilience	3	3	4	4	5	5
Teaching Others	1	2	2	3	3	4
Teamwork	3	3	4	4	5	5
Technical Competence	1	2	2	3	4	4
Writing	1	2	2	3	3	4

Table 3: Behavioral Examples for Competencies

Competency Name	Definitions
Accountability	**Holds self and others accountable for measurable high-quality, timely, and cost-effective results. Determines objectives, sets priorities, and delegates work. Accepts responsibility for mistakes. Complies with established control systems and rules.** • *Takes responsibility for results and work products* • *Ensures work is completed on time and at the level of quality required* • *Understands the rules and regulations of the work performed and ensures compliance with them* • *Demonstrates responsibility with important materials, critical processes, or confidential information*
Attention to Detail	**Is thorough when performing work and conscientious about attention to detail. Recalls information that has been presented previously.** • *Sets the standards for the quality of the work completed for the organization* • *Leads others in attending to detail in difficult and/or high-pressure circumstances* • *Reviews and edits work completed by others to ensure that the quality of work meets acceptable work standards* • *Independently completes thorough and accurate work*
Compliance	**Knowledge of procedures for assessing, evaluating, and monitoring programs or projects for compliance with Federal laws, regulations, and guidance.** • *Shows familiarity with the structure and terminology of various rules and regulations of the Federal Government* • *Demonstrates the ability to search for and find appropriate rules or regulations* • *Understands how to apply appropriate rules and regulations to guide direction of work or make decisions*
Creative Thinking	**Uses imagination to develop new insights into situations and applies innovative solutions to problems; designs new methods where established methods and procedures are inapplicable or are unavailable.** • *Creates a work environment that encourages creative thinking and innovation* • *Explores new ideas, methodologies, and alternatives to reach outcomes* • *Introduces new concepts or strategies that significantly improve or revise the way work is performed* • *Suggests or proposes alternative ways to view or define problems; is not constrained by conventional thinking and established approaches* • *Combines ideas in unique ways or makes connections between disparate ideas*

Customer Service	**Works with clients and customers (that is, any individuals who use or receive the services or products that your work unit produces, including the general public, individuals who work in the agency, other agencies, or organizations outside the Government) to assess their needs, provide information or assistance, resolve their problems, or satisfy their expectations; knows about available products and services; is committed to providing quality products and services.** • *Commits to serving the public and understands their advisory role* • *Utilizes outreach, needs assessments, evaluation, and other marketing skills to identify and anticipate customer needs and provide exemplary customer service* • *Understands diverse customer groups, their perspectives, issues and needs* • *Works to ensure customers' needs are met, even when those needs are outside of the typical role of the position* • *Identifies and develops metrics to assess customer service satisfaction* • *Continuously improves products and services* • *Works and plans strategically, using a systems perspective to anticipate developing customer issues and needs and to provide timely solutions that focus on long-term benefits*
Flexibility	**Is open to change and new information; adapts behavior or work methods in response to new information, changing conditions, or unexpected obstacles; effectively deals with ambiguity.** • *Effectively adjusts strategies or course of action in response to changing conditions* • *Makes quality decisions when faced with ambiguous situations* • *Is willing to incorporate new information into decision making process* • *Adapts behavior to overcome challenges*
Influencing/Negotiating	**Persuades others to accept recommendations, cooperate, or change their behavior; works with others towards an agreement; negotiates to find mutually acceptable solutions.** • *Persuades and influences parties to cooperate and accept recommendations* • *Explains and clarifies perspectives of an issue and its impact on all parties* • *Negotiates to achieve consensus through changed opinion, attitude, or behavior* • *Demonstrates logic, communicates and persuades others to see benefits of recommendations within and across groups* • *Understands all sides of an issue and its impact on all parties involved* • *Negotiates with individuals or groups, including those that are resistant, to consider cooperating in order to achieve an acceptable solution*
Information Management	**Identifies a need for and knows where or how to gather information; organizes and maintains information or information management systems.** • *Demonstrates an understanding of where and how data or other information are maintained* • *Shows familiarity with the information management systems of the organization* • *Effectively searches for and finds appropriate information to address the needs of a project* • *Uses discretion when handling sensitive content*
Integrity/Honesty	**Contributes to maintaining the integrity of the organization; displays high standards of ethical conduct and understands the impact of violating these**

	standards on an organization, self, and others; is trustworthy. • *Takes pride in exhibiting personal and organizational integrity and honesty* • *Acts in a just, fair, and ethical manner and encourages ethical behavior among others, even when risky to do so* • *Inspires trust and confidence among stakeholders through reliability, authenticity, and accountability*
Interpersonal Skills	**Treats others with courtesy, sensitivity, and respect. Considers and responds appropriately to the needs and feelings of different people in different situations.** • *Shows respect for the values and ideas of others, even when not agreeing with them* • *Empathizes with the concerns of others* • *Demonstrates tact and courtesy when interacting with associates* • *Is proactive in defusing arguments among peers* • *Seeks feedback from others to avoid blind-spots that can cause misunderstandings* • *Explores issues with the team; shares information; solicits ideas; uses participative decision-making processes*
Learning	**Uses efficient learning techniques to acquire and apply new knowledge and skills; uses training, feedback, or other opportunities for self-learning and development.** • *Is proactive in seeking out new knowledge* • *Devotes time to building new skillsets or further developing existing skillsets* • *Understands instructions or assignments without much need for additional explanation or clarification* • *Is open to constructive feedback on performance* • *Rarely makes the same mistake more than once* • *Effectively applies new knowledge or skills in applied environments*
Oral Communication	**Expresses information (for example, ideas or facts) to individuals or groups effectively, taking into account the audience and nature of the information (for example, technical, sensitive, controversial); makes clear and convincing oral presentations; listens to others, attends to nonverbal cues, and responds appropriately.** • *Speaks honestly, effectively, and with integrity* • *Makes convincing, articulate, and accurate oral presentations using non-verbal and vocal qualities that support the verbal spoken message* • *Effectively uses various communication channels, including meetings, presentations, and briefings* • *Actively considers, plans for, and reacts appropriately to the audience and the contextual environment in order to minimize barriers to understanding* • *Explains complex information clearly and accurately, and seeks feedback to determine that understanding has occurred* • *Acts as an effective facilitator in group or team settings*
Organizational Awareness	**Knows the organization's mission and functions, and how its social, political, and technological systems work and operates effectively within them; this includes the programs, policies, procedures, rules, and regulations of the organization.** • *Demonstrates awareness of the mission, functions, and various levels of the organization* • *Understands how decisions or actions of one organizational component may affect other components*

	• *Leverages knowledge of organizational components, programs, and directions to improve products, actions, or decisions* • *Shows familiarity with the rules and regulations of the organization*
Physical Strength and Agility	**Ability to bend, lift, climb, stand, and walk for long periods of time; ability to perform moderately heavy laboring work.** • *Demonstrates the ability to lift, push, or pull objects* • *Can spend relatively long periods of time without sitting or resting* • *Can change direction in movement with relative ease* • *Can navigate over or around obstacles to movement*
Problem Solving	**Identifies problems; determines accuracy and relevance of information; uses sounds judgment to generate and evaluate alternatives, and to make recommendations.** • *Examines problems and solutions with a long-term perspective* • *Effectively leads others in the effort of developing, identifying, and formulating problem solving strategies consistent with organizational goals* • *Uses logic to develop and implement innovative tools and techniques to resolve complex problems and issues* • *Uses logic to resolve complex, unique, or unusual problems* • *Consistently anticipates challenges that are not obvious to others* • *Determines the relevance of information in reaching effective conclusions* • *Formulates recommendations for the best course of action to address problems*
Project Management	**Knowledge of the principles, methods, or tools for developing, scheduling, coordinating, and managing projects and resources, including monitoring and inspecting costs, work, and contractor performance.** • *Schedules and keeps track of major project milestones and persons responsible* • *Communicates with various stakeholders to ensure that projects stay on time and on budget* • *Identifies and plans for external and internal barriers to project delivery* • *Delegates work to team members as necessary and ensures completion of work*
Reasoning	**Identifies rules, principles, or relationships that explain facts, data, or other information; analyzes information and makes correct inferences or draws accurate conclusions.** • *Determines the relevance of information in reaching effective conclusions* • *Uses logic to determine relationships among information in order to reach conclusions* • *Makes appropriate inferences from data, rules, or other information*
Resilience	**Deals effectively with pressure; remains optimistic and persistent, even under adversity. Recovers quickly from setbacks.** • *Achieves desired results in face of adversity* • *Overcomes barriers to accomplish goals* • *Stays positive despite setbacks* • *Works successfully in high pressure environments*

Teaching Others	**Helps others learn through formal or informal methods; identifies training needs; provides constructive feedback; coaches others on how to perform tasks; acts as a mentor.** • *Provides instruction and feedback to others* • *Acts as a mentor to others* • *Determines areas for improvement and training for others* • *Tutors others in the performance of tasks*
Teamwork	**Encourages and facilitates cooperation, pride, trust, and group identity; fosters commitment and team spirit; works with others to achieve goals.** • *Volunteers to assist associates with projects* • *Commits to working toward team or group goals* • *Displays team pride and empowers team pride among other group members* • *Works effectively in group settings in order to achieve team objectives*
Writing	**Recognizes or uses correct English grammar, punctuation, and spelling; communicates information (for example, facts, ideas, or messages) in a succinct and organized manner; produces written information, which may include technical material that is appropriate for the intended audience.** • *Composes clear, concise, and logical documents or correspondence involving complex technical information* • *Consistently and effectively tailors written products to a wide range of audiences and for diverse purposes in order to achieve a desired outcome* • *Proofreads and edits the writing of others* • *Effectively explains complex technical material to a non-technical audience* • *Uses correct grammar, punctuation, and spelling* • *Writes in an organized fashion that is easy to understand*

Table 4: General Competencies by Assessment Tool

Competency	Occupational Questionnaire	Structured Interview	Biodata	Cognitive Ability Test
Accountability	Low	High	High	Low
Attention to Detail	Low	Medium	Low	High
Compliance	Low	High	Low	Low
Creative Thinking	Low	High	Medium	Medium
Customer Service	Low	High	Low	Low
Flexibility	Low	High	Medium	Low
Influencing/Negotiating	Low	High	Low	Low
Information Management	Low	Medium	Medium	Medium
Integrity/Honesty	Low	High	Medium	Low
Interpersonal Skills	Low	High	Low	Low
Learning	Low	Medium	Medium	High

Competency	Job Knowledge Test	Personality Inventory	Situational Judgment Test	Work Sample
Accountability	Low	Medium	Medium	Low
Attention to Detail	Low	Low	Low	High
Compliance	High	Low	Medium	Medium
Creative Thinking	Low	Medium	Low	High
Customer Service	Low	Low	High	High
Flexibility	Low	High	Medium	High
Influencing/Negotiating	Low	Medium	Medium	Medium
Information Management	Medium	Low	Medium	High
Integrity/Honesty	Low	Medium	High	Low
Interpersonal Skills	Low	Medium	Medium	Medium
Learning	Low	Low	Low	Medium

Competency	Occupational Questionnaire	Structured Interview	Biodata	Cognitive Ability Test
Oral Communication	Medium	High	Medium	Low
Organizational Awareness	Low	High	Low	Low
Physical Strength and Agility	Low	Low	Low	Low
Problem Solving	Low	High	Medium	High

Project Management	Medium	High	Medium	Low
Reasoning	Low	Low	Low	High
Resilience	Low	High	Medium	Low
Teaching Others	Low	High	Medium	Low
Teamwork	Low	High	Medium	Low
Technical Competence	High	High	Low	Low
Writing	Low	Low	Medium	Low

Competency	Job Knowledge Test	Personality Inventory	Situational Judgment Test	Work Sample
Oral Communication	Low	Low	Low	High
Organizational Awareness	Medium	Low	Low	Low
Physical Strength and Agility	Low	Low	Low	High
Problem Solving	Low	Low	Medium	High
Project Management	Low	Low	High	High
Reasoning	Low	Low	High	Medium
Resilience	Low	Medium	Low	Low
Teaching Others	Low	Medium	Medium	High
Teamwork	Low	Medium	Medium	Medium
Technical Competence	High	Low	Medium	High
Writing	Low	Low	Low	High

Table 5: Technical Competencies for Assessment and Selection

The following technical competencies are valid for assessment and selection, performance management, and other related human capital functions for the biological science technician occupational series at grades 7 and above[1]. (NOTE: While the technical competencies below have been validated for assessment and selection for the series listed below, they are not REQUIRED to be used for assessment and selection for those series. Further, other technical competencies not listed below may be required depending on the position. Rely on the results of a job analysis and feedback from the hiring manager and subject matter experts to determine the exact technical competencies needed for a particular hire). Definitions for these and all technical competencies included in the study are located in Appendix A.

Biology
Data Interpretation
Ecology
Field Data Collection
Geospatial Information Systems
Measurement and Instrumentation
Wildlife Biology

[1] Per the ratings for "technical competence," which met the criteria to use for assessment and selection purposes at grades 7 and above for the GS-0404 series.

Appendix A: Competency Definitions

General Competencies

Accountability – Holds self and others accountable for measurable high-quality, timely, and cost-effective results. Determines objectives, sets priorities, and delegates work. Accepts responsibility for mistakes. Complies with established control systems and rules.

Attention to Detail – Is thorough when performing work and conscientious about attention to detail. Recalls information that has been presented previously.

Compliance – Knowledge of procedures for assessing, evaluating, and monitoring programs or projects for compliance with Federal laws, regulations, and guidance.

Creative Thinking – Uses imagination to develop new insights into situations and applies innovative solutions to problems; designs new methods where established methods and procedures are inapplicable or are unavailable.

Customer Service – Works with clients and customers (that is, any individuals who use or receive the services or products that your work unit produces, including the general public, individuals who work in the agency, other agencies, or organizations outside the Government) to assess their needs, provide information or assistance, resolve their problems, or satisfy their expectations; knows about available products and services; is committed to providing quality products and services.

Flexibility – Is open to change and new information; adapts behavior or work methods in response to new information, changing conditions, or unexpected obstacles; effectively deals with ambiguity.

Influencing/Negotiating – Persuades others to accept recommendations, cooperate, or change their behavior; works with others towards an agreement; negotiates to find mutually acceptable solutions.

Information Management – Identifies a need for and knows where or how to gather information; organizes and maintains information or information management systems.

Integrity/Honesty – Contributes to maintaining the integrity of the organization; displays high standards of ethical conduct and understands the impact of violating these standards on an organization, self, and others; is trustworthy.

Interpersonal Skills – Shows understanding, friendliness, courtesy, tact, empathy, concern, and politeness to others; develops and maintains effective relationships with others; may include effectively dealing with individuals who are difficult, hostile, or distressed; relates well to people

from varied backgrounds and different situations; is sensitive to [redacted] race, gender, disabilities, and other individual differences.

Learning – Uses efficient learning techniques to acquire and apply new knowledge and skills; uses training, feedback, or other opportunities for self-learning and development.

Oral Communication – Expresses information (for example, ideas or facts) to individuals or groups effectively, taking into account the audience and nature of the information (for example, technical, sensitive, controversial); makes clear and convincing oral presentations; listens to others, attends to nonverbal cues, and responds appropriately.

Organizational Awareness – Knows the organization's mission and functions, and how its social, political, and technological systems work and operates effectively within them; this includes the programs, policies, procedures, rules, and regulations of the organization.

Physical Strength and Agility – Ability to bend, lift, climb, stand, and walk for long periods of time; ability to perform moderately heavy laboring work.

Problem Solving – Identifies problems; determines accuracy and relevance of information; uses sound judgment to generate and evaluate alternatives, and to make recommendations.

Project Management – Knowledge of the principles, methods, or tools for developing, scheduling, coordinating, and managing projects and resources, including monitoring and inspecting costs, work, and contractor performance.

Reasoning – Identifies rules, principles, or relationships that explain facts, data, or other information; analyzes information and makes correct inferences or draws accurate conclusions.

Resilience – Deals effectively with pressure; remains optimistic and persistent, even under adversity. Recovers quickly from setbacks.

Teaching Others – Helps others learn through formal or informal methods; identifies training needs; provides constructive feedback; coaches others on how to perform tasks; acts as a mentor.

Teamwork – Encourages and facilitates cooperation, pride, trust, and group identity; fosters commitment and team spirit; works with others to achieve goals.

Technical Competence – Uses knowledge that is acquired through formal training or extensive on-the-job experience to perform one's job; works with, understands, and evaluates technical information related to the job; advises others on technical issues.

Writing – Recognizes or uses correct English grammar, punctuation, and spelling; communicates information (for example, facts, ideas, or messages) in a succinct and organized

manner; produces written information, which may include technical material that is appropriate for the intended audience.

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Technical Competencies

Animal Husbandry - Knowledge of the care and handling of animals, including feeding, controlling, restraint, health, and reproduction.

Biology - Knowledge of the environment, plant and animal living tissue, cells, organisms, and entities, including their functions, interdependencies and interactions with each other and the environment.

Botany - Knowledge of the concepts, principles, and theories of plants, including structures and functions, classification, taxonomy, plant communities, distribution, habitat requirements, life histories, reproduction, conservation, and care of plant species.

Chemistry - Knowledge of the concepts, principles, and theories of the composition, structure, and properties of substances, and of the chemical processes and transformations, including uses of chemicals and their interactions, danger signs, production techniques, and disposal methods.

Data Interpretation - Skill in collecting, analyzing, and interpreting data and policies, to determine actions and develop and propose guidance.

Earth Science - Knowledge of interdisciplinary disciplines associated with the earth's composition, structure, or other physical aspects, including atmosphere.

Ecology - Knowledge of the concepts, principles, and theories of the interrelationships among organisms and their environment, including competition and predation, evolution and natural selection, population dynamics, and the impact of natural phenomena or human actions on natural systems, processes, and biota.

Entomology - Knowledge of the concepts, principles, and theories of insects, including taxonomy, morphology, behavior, life cycles, population dynamics, host-insect interactions, the role of insects in natural and managed ecosystems, and the regulation, prevention, and control of pest-related problems.

Field Data Collection - Ability to collect, record, and ensure accuracy of field data.

Fire Management - Knowledge of the concepts, principles, and theories of fire management, including the characteristics, behavior, and ecology of fire; methodologies, strategies, and equipment used in prescribed fires; fire detection, prevention, and suppression strategies; and integration of fire with natural resource management.

First Response - Knowledge of emergency management methods, such as first aid, rescue techniques, and threat assessments.

Fishery Biology - Knowledge of the concepts, principles, and theories of aquatic life, including classification, taxonomy, population dynamics, distribution, habitat requirements, life histories, reproduction, behaviors, conservation, and care of aquatic species.

Forest Management - Knowledge of the concepts, principles, and theories of silviculture and forest ecology, forest use, management, harvesting, conducting inventories, regeneration, sustainability, and conservation; and the role of disturbances in timberland resources.

Geographical Sciences - Knowledge of the concepts, principles, theories, and methods for describing the location and distribution of land, sea, and air masses, including their physical locations, relationships, characteristics, and what the land supports.

Geology - Knowledge of the concepts, principles, and theories of the origins and structure of the earth and other planetary bodies, including the physical forces that have shaped it and its physical and organic history.

Geospatial Information Systems - Knowledge of and skill in manipulating computer systems designed for capturing, storing, analyzing, and displaying data related to positions on the surface of the earth and other planetary bodies in order to better understand spatial patterns and relationships.

Hydrology - Knowledge of the concepts, principles, theories, and methods related to the magnitude, distribution, and quality of water resources including watershed management, climatology, geomorphology, groundwater hydrology, water quality, water resource management, and groundwater/surface water interactions.

Landscape Architecture - Knowledge of the concepts, theories, and practices used in the planning, designing, construction, and adaptation of outdoor features, taking into consideration recreation planning, requirements, aesthetic value, and compatibility with other developments and resources.

Life Sciences and Systems - Knowledge of life sciences that involve the theoretical and experimental research of life systems.

Measurement and Instrumentation - Knowledge of electronics and related electrical engineering disciplines necessary for the research and development of sensors, electronic measurement devices, and instrumentation systems.

Mechanical - Knowledge of machines and tools, including their designs, uses, benefits, repair, and maintenance.

Modeling and Simulation - Knowledge of the tools and techniques used to develop functional, physical, or prototype models and simulations for test and evaluation programs, the prediction of behavior and phenomena, and to visually communicate concepts.

Pathology - Knowledge of the concepts, principles, and theories of plant, insect, or animal diseases and host/pathogen relationships, including effects on natural and managed ecosystems.

Public Planning - Knowledge of functions, principles, methods, and techniques of public planning, including those related to community planning, outdoor recreation planning, and natural resource management, such as demand forecasting, environmental impact analysis, financial forecasting, and land use planning and zoning.

Rangeland Management - Knowledge of the concepts, principles, and theories of non-forested or forested land ecosystems, including rangeland use, management, and monitoring; conducting inventories; and the role of disturbances in rangeland ecosystems.

Remote Sensing - Knowledge of the concepts, principles, theories, and methods necessary to obtain, use, and interpret data from remote sensing sources, including ground and aerospace-based sensors.

Requirements Analysis - Knowledge of the principles and methods to identify, analyze, specify, design, and manage functional and infrastructure requirements; includes translating functional requirements into technical requirements used for logical design or presenting alternative technologies or approaches.

Research and Statistics - Knowledge of scientific principles, methods, and tools of basic and applied research (for example, statistics and data analysis) used to conduct a systematic inquiry into a subject matter area.

Soil Science - Knowledge of the concepts, principles, or theories of soil composition, formation, classification, mapping, testing, and management, including erosion, pollution, conservation, and watershed management.

Wildlife Biology - Knowledge of the concepts, principles, and theories of wildlife, including classification, taxonomy, population dynamics, distribution, habitat requirements, life histories, reproduction, behaviors, conservation, and care of wildlife.

Appendix B: Biological Science Technician Tasks by Duty

Duty 1 - Communicates with others.
Associated Tasks:
Drafts correspondence or other written work (for example, manuals, technical reports, research, or contract proposals).
Explains or justifies decisions, conclusions, findings, or recommendations.
Explains technical or other complex information to a nontechnical audience.
Writes reports on study findings and recommendations.

Duty 2 – Collects data or conducts analyses.
Associated Tasks:
Analyzes or interprets data or other information.
Assists scientists in field or laboratory settings in data collection, sample collection, field observations, or analysis.
Collects and prepares samples for laboratory testing.
Conducts environmental impact, health, or safety analyses.
Conducts field experiments to test hypotheses.
Conducts field site visits, measurements, observations, and evaluations.
Deploys remote data-collection systems.
Designs or conducts analytical studies or other research.
Plans and conducts population studies.
Plans and conducts inventories.
Collects, photographs, and mounts specimens.
Researches, catalogs, and identifies status of various species.
Analyzes biological and physical components of ecosystems.
Assist in planning, organizing, and implementing biological investigations.

Duty 3 – Compiles, organizes, or conveys information.
Associated Tasks:
Collects, compiles, and organizes information.
Creates tables, charts, graphs, or diagrams to organize or show information.
Develops and maintains computer databases.
Monitors, maintains, or updates data, records, or other information.
Arranges logistics (e.g., equipment, transportation, personnel) to accomplish daily activities or solve problems.
Obtains data from various sources (e.g., Geographic Information Systems) to make decisions.

Duty 4 – Constructs, installs, inspects, or maintains technical equipment.
Associated Tasks:

Calibrates or installs technical equipment.
Constructs, operates, and maintains technical equipment.
Maintains, designs, tests, calibrates, installs, troubleshoots, or repairs equipment.
Cleans or maintains equipment (e.g., cages, nets, traps).

Duty 5 – Ensures compliance with applicable standards, regulations, laws, or procedures.
Associated Tasks:
Acquires and maintains a working knowledge of relevant laws, regulations, policies, standards, or procedures.
Interprets, evaluates, or ensures compliance with laws, regulations, policies, standards, permits, or procedures.
Ensures adherence to conduct and safety protocols of employees during the performance of duties.

Duty 6 – Makes decisions or resolves problems.
Associated Tasks:
Discusses results, problems, plans, suggestions, terms, or conditions with others.
Makes determinations based on data analysis (e.g., efficacy of an herbicide on a spray area).
Recommends or makes improvement or solutions to problems or determines appropriate actions.
Develops, modifies, or provides input on plans, goals, or objectives for projects, programs, systems, or operations.
Develops, reviews, recommends, and implements changes to mitigation program policies, standards, methods, controls, and procedures.
Provides direction for facilitating hunting and fishing activities on Federal lands.
Provides technical advice in subject matter area to others.
Review biological portions of environment assessment/impact statements or comprehensive resource planning reports to evaluate environmental consequences of proposed actions on fish, wildlife, or vegetation resources of concern.
Review management plans to ensure preservation, protection, and enhancement of native biodiversity and ecosystems for a geographic area having a variety of habitat conditions.
Reviews projects or activities proposed by other agencies, partners, or external stakeholders to identify conflicts and make recommendations on approval.
Takes immediate action to resolve problems (e.g., first aid, chemical spills, equipment issues).

Duty 7 – Collaborates or consults with others.
Associated Tasks:
Instructs classes or conducts training sessions, workshops, or seminars.
Coordinates with others to determine studies or evaluations necessary at sites.

Establishes, maintains, and cultivates relationships with external stakeholders.
Mentors staff members.
Participates in meetings with members of the public, industry, or other Federal and state agencies (e.g., conferences).
Trains field staff members.

Duty 8 – Performs other technical duties.
Associated Tasks:
Operates motor vehicles.
Conduct investigations of the status, life requirements, habitat availability, and improvement and recovery needs for various fish and wildlife, including listed threatened or endangered species, candidate species for listing, and other species of special concern.
Determines restrictions or limitations and issues permits for activities (e.g., grazing, planting, research, or commercial filming).
Establishes new and modified methods, techniques, and procedures to resolve technical problems.
Investigates and initiates reports of unauthorized use, damages, or trespass.
Keeps abreast of latest technology, information, research, etc., to maintain knowledge in field of expertise.
Maintains ecosystems by mitigating non-native plant species.
Feeds or cares for animals.
Determines mixing rates for chemicals (e.g., herbicides), taking into account factors such as time of year, species variety, or other environmental factors.