KNOWLEDGE AND SKILL GUIDELINES
for
AQUARISTS

Introduction to these Guidelines

Aquarists have an extremely varied set of responsibilities, and therefore need an equally diverse range of knowledge and skills to do their jobs. The personal characteristics aquarists identified as being important for this profession also reflect this variety: self-motivation, creativity, a willingness and ability to learn, resourcefulness, intuition, thoroughness, and the ability to work with others are just some of the key qualities that aquarists believe are important in order to do their jobs well.

With a job that includes tasks as distinct as maintaining proper lighting in an exhibit, diagnosing animal health, maintaining water quality, and building exhibits, aquarists must be comfortable using a wide range of tools. The list of equipment aquarists typically use includes: hand and power tools, ladders, and scaffolding; hazardous chemicals, epoxies, and glues; first aid equipment; fishing equipment and collection gear; plumbing equipment, lighting equipment, and pressure sprayers; and life support equipment.

As with the other professions, individuals doing much the same job often have very different titles. These might include aquarist, water quality aquarist, aquarium biologist, assistant curator, and director of husbandry. Related job titles include life support technician, lab technician, and research associate.

Basic courses required or desired for aquarists include first aid, technical and/or scientific writing, plumbing, CPR, and computer programming. They also include ecology, genetics, ichthyology, botany, aquaculture, and chemistry.

Of all the marine occupations discussed in this book, aquarists defined the most number of individual job functions for their work. The twelve functions they defined, which clearly demonstrate the diversity of this profession, are: maintaining exhibit aesthetics; maintaining life support; maintaining water quality; maintaining support areas; acquiring specimens; feeding specimens; maintaining animal health; propagating specimens (aquaculture); designing exhibits; installing exhibits; assisting with training, education, and media relations; and continuing professional development.

Personal characteristics of an aquarist

The workshop participants felt that the following list of personal characteristics described a good aquarist:

- Self-motivated
- Versatile
- Possessing a very high work ethic

- Professional
- Creative
- Able to work independently
- Detail-oriented
- Able to learn
- Willing to learn
- Flexible
- Able to problem-solve
- Able to work well under pressure
- Resourceful
- Intuitive
- Possessing physical and mental stamina
- Able to work well in a team environment
- Dependable
- Patient
- Possessing manual dexterity
- Possessing a sense of humor
- Able to work in a cold, damp (or hot, humid) environment – extreme environmental conditions for long periods of time
- Empathetic
- Objectively compassionate
- Communicative
- Thorough
- Tolerant
- Motivational

Tools and equipment typically used

- Hand and power tools
- SCUBA gear
- Hazardous chemicals/materials
- Cement, epoxys
- Pumps
- Plumbing equipment
- Lighting equipment
- Hydro-cleaner
- Cameras
- Computers
- Cleaning and maintenance equipment
- Scientific/laboratory equipment – pH meters, DO meter, hydrometer, saturometer, refractometer, microscope, ORP (oxidation/reduction potential) meter, electronic balances
- Boat
- Forklift

- Large trucks/commercial vehicles
- Veterinary equipment – syringes, medical equipment, first aid
- Buckets
- Nets
- Collection gear
- Siphon hoses and other flexible hoses
- Rigid PVC
- Food processing equipment – blenders, knives, cutting boards
- Swiss army knife and leatherman
- Filters
- Scaffolding, pump jacks, bottle openers
- Ladders
- Scissor lifts
- "Cherry pickers" – hydraulic bucket lift
- Ozone generator
- Life support equipment
- Heaters/chillers
- Micromesh
- Silicon glue
- Seine
- Fishing equipment
- Spear guns
- Navigational equipment
- Aquariums
- Acrylic panels and glass
- Fiberglass
- Respirators
- Compressors
- Pressure sprayers
- Recirculating transport systems (to move large animals from collection site to aquarium)

Job titles

Trainee = 1
Entry level = 2
Senior level = 3
Supervisory level = 4

- Aquarist trainee (1)
- Assistant aquarist (1)
- Student aquarist (1)
- Aquarist aide (1)
- Co-op aquarist (1)

- Aquarist divers (1 or 2 or 3)
- Aquarist (2)
- Aquarist I (2)
- Water quality aquarist (2 or 3)
- Water quality specialist (2 or 3)
- Aquarium biologist I (2)
- Aquarist II (3)
- Aquarium biologist III (3 or 4)
- Aquarium biologist IV (3)
- Senior aquarist (3 or 4)
- Assistant curator (4)
- Associate curator (4)
- Supervisor aquarist (4)
- Curator of water quality (4)
- Curator of (specific area) (4)
- Curator (4)
- Assistant director of husbandry (4)
- Supervisor of aquarist (4)
- General curator (4)
- Director of husbandry (4)

Related job titles

- Life support technicians
- Life support engineers
- Laboratory technician
- Research associate (four-year degree to Ph.D.)

Basic courses required or desired

- First aid
- SCUBA
- CPR
- DAN O_2 Provider
- Coast Guard safe boating course
- Marine biology
- Invertebrate zoology
- Ecology
- Genetics
- Animal nutrition
- Microbiology
- Anatomy
- Physiology
- Behavioral biology
- Parasitology
- Ichthyology
- Ornithology
- Botany
- Aquaculture
- Physics/fluid dynamics
- Chemistry
- Geometry
- Algebra
- Statistics
- Technical/scientific writing
- Computer:
    - database design
    - spreadsheets
    - web design
    - programming
- Speech/communication
- Management training
- Conflict resolution training
- Shop class (metal and wood work)
- Plumbing
- Electronics/electrics
- Design (art/interior design/landscape design)

Future trends

The twelve aquarists felt the following trends were going to be increasingly important in the future:

- The use of remote sensing for tracking and identifying animals
- The use of computer-controlled life support systems
- The ability to generate computer graphics
- The ability to use computer programming skills
- The ability to propagate animals (aquaculture)
- The ability to apply photo analysis techniques
- The ability to manage data
- The ability to manage people
- The ability to manage projects
- The need for continued professional development
- The ability to write technical/scientific documents
- An understanding of environmental/government regulations and permitting
- The ability to deal with non-government organizations (e.g., animal rights groups)
- The ability to provide informal education and speak to audiences
- The ability to work with the media
- The ability to form partnerships with other organizations
- The ability to fund-raise
- The ability to write grants

Salaries

***Salaries are very regionally dependent and closely tied to the cost of living.

Entry level aquarist:
Low range: $14,000 – $15,000 per year
Average range $22,000 – $26,000 per year
Highest: $29,000

Senior level aquarist (e.g., 5 years experience)
Low range: $18,000 – $19,000 per year
Average range: $26,000 – $35,000 per year
Highest: $42,000 per year

Supervisory level:
Low range: $24,000 – $30,000 per year
Average range: $35,000 – $65,000 per year
Highest: $115,000 per year

Knowledge and Skill Guidelines for Aquarists

Workshop Participant List

Workshop Facilitator: Deidre Sullivan
Workshop Recorder: Jill Zande

Workshop Date: May 28, 2000
Workshop Location: Aquarium of the Americas, New Orleans, LA

Panel of Aquarists

Steven Bailey	New England Aquarium, Boston, MA
Andy Case	Monterey Bay Aquarium, Monterey, CA
Tony Davi	Aquarium of the Americas, New Orleans, LA
J. Charles Delbeek	Waikiki Aquarium, Honolulu, HI
Thomas Fenske	Colorado Ocean Journey, Denver, CO
Sally Hoke	Texas State Aquarium, Corpus Christi, TX
Kevin Lewand	Underwater World at Pier 30, San Francisco, CA
Melissa Phipps	Riverbanks Zoological Park, Columbia, SC
Juan Sabalones	Newport Aquarium, Newport, KY
Gustave Stout	National Aquarium in Baltimore, Baltimore, MD
Erika Schissler	Newport Aquarium, Newport, KY
R. Will Vanoy	Moody Gardens, Galveston, TX

Knowledge and Skill Overview Chart for Aquarists

Job description: Individuals who design, maintain, and manage aquatic collections in a controlled environment.

JOB FUNCTIONS	***TASK AREAS***					
A. Maintain exhibit aesthetics	A1 Observe and assess exhibits	A2 Remove unwanted material and maintain substratum and aquascape	A3 Maintain viewing surface	A4 Add or remove specimens	A5 Maintain proper lighting	
B. Maintain life support	B1 Observe, assess, and record equipment function and perform scheduled and essential maintenance	B2 Troubleshoot, repair, and replace equipment as needed				
C. Maintain water quality	C1 Determine and maintain acceptable water quality standards	C2 Evaluate results and develop remediation protocols				
D. Maintain support areas	D1 Establish and comply with institutional and OSHA safety standards	D2 Organize, store, and inventory equipment properly				

Knowledge and Skill Overview Chart for Aquarists (continued)

JOB FUNCTIONS	*TASK AREAS*					
E. Acquire specimens	E1 Determine specimens needed	E2 Identify appropriate sources for specimens	E3 Research regulations and obtain permits	E4 Obtain specimens (collect, purchase, or trade)	E5 Transport specimens	E6 Acclimate and stabilize specimens in quarantine and introduce to exhibits
F. Feed specimens	F1 Determine appropriate dietary/ nutritional needs	F2 Acquire and maintain inventory of food items	F3 Comply with federal and state requirements for food handling and preparation	F4 Prepare food and feed specimens		
G. Maintain animal health	G1 Observe, assess, report, and diagnose animal health	G2 Apply appropriate treatments and/or actions	G3 Record decisions, actions, and results	G4 De-access specimen if required		
H. Propagate specimens (aquaculture)	H1 Determine target organism for culture	H2 Research, develop, and implement techniques for culturing and rearing				

Knowledge and Skill Overview Chart for Aquarists (continued)

.

JOB FUNCTIONS	*TASK AREAS*					
I. Design exhibits	I1 Determine exhibit theme, focus, and intent	I2 Conduct feasibility study and produce action plan	I3 Build model or create diagram and present ideas	I4 Design appropriate life support system		
J. Install exhibits	J1 Locate and order materials	J2 Secure and hold specimens	J3 Prepare location	J4 Construct and stock exhibit	J5 Determine specimen and maintenance protocols	J6 Determine how to evaluate exhibit effectiveness after it is completed
K. Assist with training, education, and media relations	K1 Train and organize volunteers, interns, and new staff and maintain exemplary standards	K2 Assist in the development and implementation of curriculum and/or exhibit materials	K3 Interact with and make presentations to the public and media			
L. Continue professional development	L1 Read appropriate journals and periodicals and attend conferences and share information	L2 Participate in exchange programs	L3 Develop research projects and publish papers	L4 Participate on institutional and professional committees		

Knowledge and Skill Guidelines for Aquarists

Critical work function A: Maintain exhibit aesthetics

TASK	Performance Indicators How do we know when the task is performed well?	Technical Knowledge and Skills What marine technicians need to know and/or be able to do in order to perform this task well
A1. **Observe and assess exhibits**	• Water clarity meets exhibit expectations. • Excess detritus is identified. • Dead or unhealthy animals are identified. • Appropriate supervisor has been notified. • End result meets supervisor's expectations. • Positive feedback is received from visitors.	• Knowledge of desired exhibit quality standards • Knowledge of animal behavior • Ability to identify diseased or distressed animals • Ability to observe detail • Ability to communicate effectively • Ability to survey visitors
A2. **Remove unwanted material and maintain substratum and aquascape**	• Exhibit meets expected standards. • Appropriate habitat is displayed with no injury to specimens or aquarist and no damage to exhibit. • End result meets supervisor's expectations.	• Knowledge of desired exhibit quality standards • Knowledge of how the natural habitat should look • Ability to use appropriate tools (e.g., siphon hoses, tongs, nets, SCUBA gear, cleaning pads, HTH (calcium hypochlorite), pressure sprayers, gravel washer) • Ability to lift 50 lbs. to waist level • Ability to navigate scaffolding safely • Ability to minimize safety risk
A3. **Maintain viewing surface**	• Viewing surface is clear and free of scratches.	• Ability to use algae-removing tools (e.g., razorblades, scrapers) • Ability to use underwater polishing tools (e.g., sandpaper, underwater orbital sander)

Knowledge and Skill Guidelines for Aquarists

Critical work function A: Maintain exhibit aesthetics (continued)

TASK	**Performance Indicators** How do we know when the task is performed well?	**Technical Knowledge and Skills** What marine technicians need to know and/or be able to do in order to perform this task well
A4. **Add or remove specimens**	• Appropriate collection is displayed with no injury to specimens or aquarist and no damage to exhibit.	• Ability t o use nets, buckets, rod and reel, and siphons • Ability to administer anesthetics • Ability to use rigging (e.g., hoists, slings, and stretchers) • Ability to lift 50 lbs. to waist level • Ability to navigate scaffolding safely • Ability to minimize risk
A5. **Maintain proper lighting**	• Lighting is adequate for specimen population. • Lighting is adequate for public viewing. • Lighting meets exhibit goals.	• Knowledge of lighting systems and technologies • Knowledge of appropriate photoperiods and intensities • Knowledge of light spectrums • Knowledge of electricity

Knowledge and Skill Guidelines for Aquarists

Critical work function B: Maintain life support

TASK	Performance Indicators How do we know when the task is performed well?	Technical Knowledge and Skills What marine technicians need to know and/or be able to do in order to perform this task well
B1. Observe, assess, and record equipment function and perform scheduled and essential maintenance	• System performs within design specifications. • No equipment failures occur due to lack of or inappropriate maintenance. • Equipment function logs are completed properly. • Maintenance request forms completed properly.	• Knowledge of design specifications • Knowledge of pertinent equipment (e.g., pumps, chillers, heater, filters) • Ability to perform basic electrical, plumbing, carpentry, and fabrication tasks • Ability to work with hand tools • Ability to adjust systems properly • Ability to work in confined spaces • Ability to read and follow technical manuals • Ability to SCUBA dive • Ability to communicate effectively
B2. Troubleshoot, repair, and replace equipment as needed	• Potential problems are identified in a timely manner. • Maintenance request forms are completed properly. • System performs within design specifications.	• Knowledge of design specifications • Knowledge of pertinent equipment (e.g., pumps, chillers, heater, filters) • Ability to perform basic electrical, plumbing, carpentry, and fabrication tasks • Knowledge of safety, electrical, and plumbing procedures • Ability to work with hand tools • Ability to adjust systems properly • Ability to install equipment properly • Ability to work in confined spaces • Ability to SCUBA dive • Ability to communicate effectively • Ability to read and follow technical manuals

Knowledge and Skill Guidelines for Aquarists

Critical work function C: Maintain water quality

TASK	Performance Indicators How do we know when the task is performed well?	Technical Knowledge and Skills What marine technicians need to know and/or be able to do in order to perform this task well
C1. **Determine and maintain acceptable water quality standards**	• Excellent water clarity is maintained. • Animals are healthy, with a low mortality rate over time. • Appropriate actions are taken after data evaluation. • Positive feedback is received from visitors.	• Knowledge of natural water quality • Knowledge of water chemistry • Ability to use and maintain water testing equipment • Knowledge of appropriate testing schedules • Knowledge of animal physiology • Ability to maintain databases and keep active records • Ability to communicate effectively
C2. **Evaluate results and develop remediation protocols**	• Water chemistry is on target. • Records and reports are kept up-to-date.	• See C1. • Knowledge of water remediation procedures (acid and alkaline buffers, trace elements, activated carbon and methods of removing unwanted chemicals in the water) • Knowledge of mathematical conversion equations and stoichiometry

Knowledge and Skill Guidelines for Aquarists

Critical work function D: Maintain support areas (e.g., holding and quarantine)

TASK	**Performance Indicators** How do we know when the task is performed well?	**Technical Knowledge and Skills** What marine technicians need to know and/or be able to do in order to perform this task well
D1. **Establish and comply with institutional and OSHA safety standards**	• Surfaces are clean and disinfected. • Excellent water clarity and quality is maintained in holding areas. • Animals are healthy, with a low mortality rate over time. • Areas meet institutional and OSHA standards. • No citations or violations occur. • Appropriate actions are taken after data evaluation. • No injuries are reported.	• Ability to keep work areas organized and free of clutter • Knowledge of OSHA and institutional safety standards
D2. **Organize, store, and inventory equipment properly**	• Adequate equipment and supplies are on hand. • Equipment and supplies are ordered in a timely manner.	• Knowledge of inventory systems • Ability to organize inventory and maintain records • Ability to maintain databases

Knowledge and Skill Guidelines for Aquarists

Critical work function E: Acquire specimens

TASK	**Performance Indicators** How do we know when the task is performed well?	**Technical Knowledge and Skills** What marine technicians need to know and/or be able to do in order to perform this task well
E1. **Determine specimens needed**	• Appropriate specimens are in collection.	• Knowledge of specimen habitat • Knowledge of specimen space requirements and compatibility • Ability to communicate effectively
E2. **Identify appropriate sources for specimens**	• Appropriate sources (wholesalers, other aquariums, the wild) for specimens are identified.	• Ability to locate and contact suppliers (e.g., wholesalers, other aquariums) • Knowledge of natural environment and collecting areas • Ability to communicate effectively
E3. **Research regulations and obtain permits**	• All pertinent regulations are adhered to. • No citations are issued.	• Knowledge of domestic and foreign permit regulations • Ability to plan ahead and wait patiently
E4. **Obtain specimens (collect, purchase, or trade)**	• Specimens are collected within institutional and AZA guidelines. • Specimens are obtained with minimal impact to the environment. • Specimens are acquired at a fair price.	• Knowledge of specimen availability at other institutions and wholesalers • Knowledge of purchasing procedures • Knowledge of collecting areas • Ability to recognize healthy specimens • Ability to apply environmentally-friendly collecting methods (e.g., SCUBA, nets, seines, fishing gear, boats, chemicals) • Ability to communicate well, both orally and in writing

Knowledge and Skill Guidelines for Aquarists

Critical work function E: Acquire specimens (continued)

TASK	Performance Indicators How do we know when the task is performed well?	Technical Knowledge and Skills What marine technicians need to know and/or be able to do in order to perform this task well
E5. **Transport specimens**	• Specimens arrive without delay. • Specimens arrive in good condition.	• Ability to read airline schedules • Knowledge of appropriate transportation guidelines and regulations • Knowledge of weather and potential impacts on shipping schedules • Knowledge of appropriate shipping techniques for each specimen • Knowledge of animal behavior to monitor during transport • Knowledge of compressed gases and cylinders
E6. **Acclimate and stabilize specimens in quarantine and introduce specimens to exhibits**	• Appropriate animals are separated. • Specimens are not damaged. • Specimens behave in a normal manner (e.g., eating, swimming, hiding). • Supervisors are notified of abnormal behavior. • No disease outbreak occurs. • Log books are up-to-date.	• Knowledge of animal behavior and compatibility • Knowledge of animal anatomy and physiology • Knowledge of animal stress indicators • Ability to communicate effectively

Knowledge and Skill Guidelines for Aquarists

Critical work function F: Feed specimens

TASK	Performance Indicators How do we know when the task is performed well?	Technical Knowledge and Skills What marine technicians need to know and/or be able to do in order to perform this task well
F1. **Determine appropriate dietary/nutritional needs**	• Overall appearance of animals is natural. • Animals are living as close to normal life-span as possible. • If specimens reproduce, they produce viable offspring.	• Knowledge of normal animal appearance and behavior • Ability to determine nutritional needs • Knowledge of nutritional requirements and natural diet • Knowledge of dietary supplements • Ability to read scientific literature • Ability to use technology to access information
F2. **Acquire and maintain inventory of food items**	• Appropriate quantity and quality of food is available. • Food is ordered in a timely manner.	• Knowledge of wholesale food industry • Knowledge of purchasing procedures • Knowledge of inventory systems • Ability to maintain an appropriate quantity of food • Ability to estimate/calculate rate of consumption • Ability to recognize food quality • Knowledge and skills to maintain live cultures (e.g., rotifers, *Artemia*, green water)
F3. **Comply with federal and state requirements for food handling and preparation**	• Food preparation area is cleaned and organized. • Compliance with USDA and institutional food handling regulations is maintained. • Facility passes periodic inspections. • No violations or citations occur.	• Knowledge of federal (USDA) and state and institutional standards for food holding, handling, and preparation • Ability to maintain a clean and organized work environment • Ability to work and communicate effectively with regulatory bodies

Knowledge and Skill Guidelines for Aquarists

Critical work function F: Feed specimens (continued)

TASK	Performance Indicators How do we know when the task is performed well?	Technical Knowledge and Skills What marine technicians need to know and/or be able to do in order to perform this task well
F4. **Prepare food and feed specimens**	• Food is of appropriate size, quality, quantity, and composition. • Animals are not under- or over-nourished. • All animals are observed feeding. • No excess food material remains after feeding. • Log books are up-to-date. • Appropriate staff are notified of irregularities in feeding behavior.	• Knowledge of natural feeding behaviors • Knowledge of feeding techniques and tools (e.g., auto-feeders, feeding poles) • Ability to use and maintain food processing equipment effectively and safely • Ability to communicate effectively

Knowledge and Skill Guidelines for Aquarists

Critical work function G: Maintain animal health

TASK	**Performance Indicators** How do we know when the task is performed well?	**Technical Knowledge and Skills** What marine technicians need to know and/or be able to do in order to perform this task well
G1. **Observe, assess, report, and diagnose animal health**	• Appropriate observations are recorded. • All diseases are detected and diagnosed correctly. • Appropriate people are notified. • Appropriate actions are taken toward treatment.	• Knowledge of normal animal appearance and behavior • Knowledge of animal anatomy and physiology • Knowledge of diseases and symptoms • Knowledge of diagnostic techniques • Knowledge of water chemistry and its effect on specimens • Ability to administer institutional quarantine protocol • Ability to use a microscope • Ability to communicate effectively
G2. **Apply appropriate treatments and/or actions**	• Spread of disease is halted or contained. • Abnormal behavior ceases. • Specimens recover. • Minimal mortality occurs. • Appropriate people are contacted for consultation.	• Knowledge of drug administration, side effects, and proper disposal. • Ability to recognize proper dosage levels • Knowledge of mathematical conversion equations and stoichiometry • Ability to interact with staff veterinarian

Knowledge and Skill Guidelines for Aquarists

Critical work function G: Maintain animal health (continued)

TASK	Performance Indicators How do we know when the task is performed well?	Technical Knowledge and Skills What marine technicians need to know and/or be able to do in order to perform this task well
G3. Record decisions, actions, and results	• Pertinent data are available for review in a timely fashion. • Appropriate people are informed about the progress of a case.	• Knowledge of appropriate terminology • Ability to use database programs • Ability to reassess situations • Ability to record information concisely and completely
G4. De-access specimen if required	• Necropsy is performed and reports are completed properly. • Histologies are sent in. • Remains and materials are disposed of properly.	• Knowledge of animal anatomy and physiology • Knowledge of pathological procedures • Knowledge of appropriate regulations • Knowledge of hazardous waste disposal • Knowledge of proper safety procedures

Knowledge and Skill Guidelines for Aquarists

Critical work function H: Propagate specimens (aquaculture)

TASK	**Performance Indicators** How do we know when the task is performed well?	**Technical Knowledge and Skills** What marine technicians need to know and/or be able to do in order to perform this task well
H1. **Determine target organism for culture**	• Institution's goals and objectives are met. • Cost-benefit analysis is favorable.	• Knowledge of institution's conservation goals • Knowledge of current literature and methods • Knowledge of animal husbandry requirements • Ability to network with other institutions • Ability to conduct a cost-benefit analysis
H2. **Research, develop, and implement techniques for culturing and rearing**	• Propagation of target specimens is successful. • Animals are reared to adulthood.	• Knowledge of sources for brood stock • Knowledge of techniques to elicit reproductive behavior • Knowledge of larval foods and care • See B, C, D, E, and G.

Knowledge and Skill Guidelines for Aquarists

Critical work function I: Design exhibits

TASK	**Performance Indicators** How do we know when the task is performed well?	**Technical Knowledge and Skills** What marine technicians need to know and/or be able to do in order to perform this task well
I1. Determine exhibit theme, focus, and intent	• Exhibit ideas meet institutional goals and intentions.	• Understanding of institutional mission statement • Knowledge of natural habitats • Ability to think creatively • Ability to communicate effectively • Ability to work in a team
I2. Conduct feasibility study and produce action plan	• Feasibility study is conducted and presented. • Proper input is solicited; the concerns of appropriate individuals are addressed. • Action plan is drafted and presented. • Plan meets the approval of governing bodies.	• Ability to conceptualize and convey ideas • Ability to conduct feasibility study • Ability to produce an action plan with budgets and timelines • Ability to communicate effectively • Ability to work in a team
I3. Build model or create diagram and present ideas	• Proper input is solicited; the concerns of appropriate individuals are addressed. • Designs are enthusiastically received by supervisors and staff.	• Ability to draft (CAD) blueprints • Ability to create a model • Ability to use PowerPoint • Ability to communicate effectively

Knowledge and Skill Guidelines for Aquarists

Critical work function I: Design exhibits (continued)

TASK	Performance Indicators How do we know when the task is performed well?	Technical Knowledge and Skills What marine technicians need to know and/or be able to do in order to perform this task well
I4. **Design appropriate life support system**	• Animal health and water quality standards are met and maintained. • Exhibit appearance meets objectives. • Budgetary goals are met. • Enrichment goals are met.	• Knowledge of animal health and water quality standards • Knowledge of current filtration technology • Ability to design filtration adequate to task • Ability to define and stay on budget

Knowledge and Skill Guidelines for Aquarists

Critical work function J: Install exhibits

TASK	Performance Indicators How do we know when the task is performed well?	Technical Knowledge and Skills What marine technicians need to know and/or be able to do in order to perform this task well
J1. Locate and order materials	• Materials are purchased on budget. • Materials are of suitable quality. • Materials are on site on time.	• Knowledge of purchasing procedures • Knowledge of construction materials and suppliers • Ability to draft bids and acquire materials in an efficient way • Ability to communicate effectively • Ability to network
J2. Secure and hold specimens	• Adequate holding spaces are available. • Animals arrive on time and on budget. • See E and F.	• See E and F.
J3. Prepare location	• Space is suitable for specimens. • Electrical and climate requirements are met (HVAC = heating, ventilation, and air conditioning). • Space is prepared on time and on budget.	• Knowledge of construction • Knowledge of ambient environmental parameters • Knowledge of electrical requirements • Knowledge of plumbing requirements • Ability to read and interpret blueprints

Knowledge and Skill Guidelines for Aquarists

Critical work function J: Install exhibits (continued)

TASK	Performance Indicators How do we know when the task is performed well?	Technical Knowledge and Skills What marine technicians need to know and/or be able to do in order to perform this task well
J4. **Construct and stock exhibit**	• Exhibit looks and functions as designed (e.g., no leaks; water motion is adequate). • Exhibit is completed on time and on budget.	• Knowledge of construction techniques (e.g., carpentry, plumbing, fiberglass, rock work, window installation) • Knowledge of electrical systems (light fixtures and installation) • Knowledge of preparation for living specimens (curing, water quality, cycling) • Knowledge of animal behavior (including stress indicators) and compatibility • Knowledge of animal anatomy and physiology • Ability to meet timelines and stay on budget • Ability to communicate effectively
J5. **Determine specimen and maintenance protocols**	• Animal health is maintained. • Exhibit meets expected standards. • Exhibit functions over a long period of time as designed.	• See B, C, and F.
J6. **Determine how to evaluate exhibit effectiveness after it is completed**	• Accurate feedback is received from visitors.	• Ability to design an effective visitor survey

Knowledge and Skill Guidelines for Aquarists

Critical work function K: Assist with training, education, and media relations

TASK	Performance Indicators How do we know when the task is performed well?	Technical Knowledge and Skills What marine technicians need to know and/or be able to do in order to perform this task well
K1. **Train and organize volunteers, interns, and new staff and maintain exemplary standards**	• Independent, dependable workers are produced. • Turnover of volunteers and interns is low. • Volunteers and interns move on to careers in the field. • A positive workplace environment is maintained. • Positive feedback is received.	• Knowledge of and enthusiasm for profession • Ability to manage people • Ability to collate, synthesize, and simplify information • Ability to provide positive feedback often and in a sincere way
K2. **Assist in the development and implementation of curriculum and/or exhibit materials**	• Exhibit materials are accurate. • Institution has a good public image and meets goals regarding education and conservation. • Favorable comments are received from the public.	• Ability to develop and implement training materials and programs • Ability to read and comprehend written materials • Knowledge of natural habitat • Knowledge of organism ecology and biology • Ability to communicate effectively
K3. **Interact with and make presentations to the public and media**	• Positive feedback is received from visitors. • Positive media coverage occurs. • The media and public return on a regular basis.	• Knowledge of and enthusiasm for profession • Ability to exhibit good personal hygiene and professional appearance • Ability to communicate effectively • Knowledge of media relations • Ability to exhibit patience

Knowledge and Skill Guidelines for Aquarists

Critical work function L: Continue professional development

TASK	**Performance Indicators** How do we know when the task is performed well?	**Technical Knowledge and Skills** What marine technicians need to know and/or be able to do in order to perform this task well
L1. **Read appropriate journals and periodicals and attend conferences and share information**	Aquarist: • Offers new solutions to old problems. • Becomes a recognized expert in the field. • Is consulted by other institutions. • Becomes a resource for other staff. • Exhibits continually improve.	• Ability to read and comprehend written materials • Ability to synthesize and implement new information • Ability to accept and theorize new ideas • Ability to network
L2. **Participate in exchange programs**	• Effective networking occurs with colleagues at other institutions. • Transfer of knowledge occurs among institutions. • Aquarist brings new skills and abilities to home institution. • Aquarist receives favorable reports from host institution.	• Ability to network • Ability to work in a team • Ability to work in a foreign setting • Ability to accept new ideas and be flexible • Ability to exhibit strong interpersonal skills • Ability to communicate effectively

Knowledge and Skill Guidelines for Aquarists

Critical work function L: Continue professional development (continued)

TASK	Performance Indicators How do we know when the task is performed well?	Technical Knowledge and Skills What marine technicians need to know and/or be able to do in order to perform this task well
L3. **Develop research projects and publish papers**	Aquarist: • Meets goals and objectives of research. • Offers new solutions to old problems. • Becomes a recognized expert in the field. • Is consulted by other institutions. • Becomes a resource for other staff.	• Knowledge of current scientific literature • Ability to design and implement a research protocol • Ability to analyze and interpret results • Ability to write scientific papers • Ability to generate funding • Ability to manage time effectively
L4. **Participate on institutional and professional committees**	Aquarist: • Offers new solutions to old problems. • Becomes a recognized expert in the field. • Is consulted by other institutions. • Becomes a resource for other staff. • Brings new skills and abilities to home institution. • Receives favorable reports from host institution. • Exhibits continually improve. • Effective networking occurs with colleagues at other institutions. • Transfer of knowledge occurs among institutions.	• Ability to work in a group environment • Ability to design and implement action plans • Ability to communicate effectively • Ability to exhibit patience • Ability to exhibit strong interpersonal skills • Ability to collate, synthesize, and simplify information • Ability to organize meetings, people, and information • Ability to make professional presentations in front of groups