

**CAREER
PATHS**



MEDICAL EQUIPMENT REPAIR

Virginia Evans - Jenny Dooley - John Lehnert



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Book

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Scope and Sequence

Unit	Topic	Reading context	Vocabulary	Function
1	The Biomedical Engineering Technologist	Job posting	assess, Biomedical Engineering Technologist (BMET), calibrate, device, inspect, install, maintain, medical, repair, train	Talking about experience
2	Manual Devices	Article	heartbeat, mechanical scale, mercury thermometer, microscope, observe, reading, sphygmomanometer, stethoscope, temperature, weight	Describing a preference
3	Hospital Departments	Webpage	cardiology, dermatology, emergency, obstetrics, orthopedics, pathology, pediatrics, pharmacy, radiology, surgery	Describing order
4	Hospital Staff	Hospital directory	anesthesiologist, cardiologist, general practitioner, lab technician, nurse, obstetrician, pediatrician, pharmacist, radiologist, surgeon	Clarifying information
5	Safety 1	Poster	coverall, electrical PPE, eye wash station, flammable, glove, goggles, hazardous, respirator, safety can, toxic	Stressing a point
6	Safety 2	Textbook excerpt	chemical, electrical, electrical analyzer, exposed, fire safety, hot, mechanical, PPE, shock, toxicity, wire	Giving a warning
7	Numbers and Basic Math	Chart	add, divide by, equal, less, minus, multiply, over, plus, plus, subtract, times	Making an apology
8	Analyzing Quantities	Textbook excerpt	-out of-, convert, decimal number, fraction, mixed number, percent, point (.), quantity, reduce, whole number	Enumerating
9	Measurements	Conversion manual	Celsius, centimeter, Fahrenheit, fluid ounce, gram, imperial, inch, metric, milliliter, ounce, volume, weight	Asking for confirmation
10	Common Parts	To-Do List	AC power cord, cable, compartment, cuff, dial, hose, knob, manual, printout, recorder module, switch	Enquiring about knowledge
11	Describing Problems 1	Assessment list	broken, fail, incorrect, loose, malfunction, run, slow, stuck, turn off, turn on	Asking for more information
12	Describing Problems 2	Memo	blow, clog, crack, fray, hole, leak, short, split, warp, wear and tear	Asking for help
13	Monitoring Equipment	Report	blood oxygen content, blood pressure, central station, ECG waveform, heart rate, monitoring equipment, multiparameter monitoring system, physiological monitoring system, respiratory rate, temperature, vital signs	Making a suggestion
14	Preventing Infections	Email	antibiotic, antimicrobial, bacteria, biohazard, contagious, disinfectant, facemask, infection, quarantine, transmit, virus	Expressing fear
15	Education	Webpage	associate's degree, BMD, CBET, certification, CET, chemistry, CLES, CNES, computer science, CRES, electricity	Asking for an opinion

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Scope and Sequence

Unit	Topic	Reading context	Vocabulary	Function
1	SI Units	Textbook passage	base unit, derived unit, Joule, Kelvin, kilogram, meter, mole, Newton, Pascal, SI unit	Expressing surprise
2	Sensory Scopes	Memo	densitometer, electronic probe thermometer, endotracheal tube, fetal heart detector, fetal monitor, laryngoscope, ophthalmoscope, otoscope, slit lamp, tympanic thermometer	Enquiring about knowledge
3	Endoscopes	Manual	camera, channel, endoscope, flexible, insufflator, irrigation, light source, rigid, suction, video monitor	Asking for help
4	IV Pumps	Note	continuous, direct, infusion rate, intermittent, IV pump, macrodrip, microdrip, parenteral, roller clamp, saline	Describing mixed results
5	Imaging Equipment 1	Pamphlet	bioimaging, contrast, CT, Doppler effect, endoscopy, feed, fiber optics, gel, ionizing radiation, noise, projection, radiography, tube, ultrasound, X-ray	Expressing uncertainty
6	Imaging Equipment 2	Journal article	confocal imaging, cyclotron, digital, electron microscopy, fluorophore, fMRI, gamma camera, modality, MR spectroscopy, MRI, PET imaging, radioactive molecule, SPECT, pixel	Clarifying information has been understood
7	Defibrillators	FAQs	atrial fibrillation, boost, capacitor, charge storage, crash cart, defibrillator, discharge relay, paddle, polarize, surge, ventricular fibrillation, voltage multiplier	Enquiring about probability
8	Circulatory System Equipment 1	Equipment list	CO ₂ analyzer, Doppler blood flow detector, glucometer, invasive blood pressure monitor, noninvasive blood pressure monitor (NIBP), POC analyzer, pressure transducer, pulse oximeter, transcutaneous, telemetry	Enumerating
9	Circulatory System Equipment 2	Schedule of events	automatic tourniquet, blood warmer, dry heat warmer, fluid controller, heart-lung machine, inflate, PCA pump, perfusionist, peristaltic pump, piston pump, pressure infuser, sequential compression device, sleeve, warm bath warmer	Assigning tasks
10	Respiratory System Equipment 1	Article	compressed air, compressor, face mask, gas supply, iron lung, local tank, lung, mechanical ventilation, negative pressure ventilator, pipe in, positive pressure ventilator, respiratory system, trachea, tracheostomy	Making a suggestion
11	Respiratory System Equipment 2	Manual	airway pressure, CPAP, end inspiratory pressure, expiratory pause, HFOV, I:E ratio, inspiratory pause, IRV, minute ventilation, peak inspiratory pressure, SIMV, tidal volume expired, tidal volume inspired, ventilatory cycle	Asking for more information
12	Renal System Equipment	Textbook chapter	access point, AV fistula, catheter, dialyzer, hemodialysis, kidney, nontunneled, pump, remove, renal, tunneled, waste product, water purification system	Agreeing with an opinion
13	Anesthesia Equipment	Checklist	absorb, anesthesia, anesthetic agent, anesthetic machine, backup battery power, canister, gas monitor, heated, humidifier, hypothermia, recirculate, vaporizer	Confirming information
14	Infant Care Equipment	Report	APGAR timer, bili light, bilirubin therapy, blanket, gasket-sealed, hatch, incubator, infant, infant resuscitator, newborn, overhead, photometer, ultraviolet	Suggesting another option
15	Surgical Tools	Textbook chapter	active electrode, bipolar operation, blend, cauterize, coagulate, cut, electrosurgery machine, footswitch, forceps, grounding electrode, jaw, monopolar operation, sink, source	Disagreeing with an opinion

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Scope and Sequence

Unit	Topic	Reading context	Vocabulary	Function
1	Computers	Memo	access, admit, desktop, keyboard, laptop, mobile computer station, monitor, mouse, patient history, patient record, server, smartphone	Expressing gratitude
2	Networks	Email	CAT-5, connection, data sharing, guest, intranet, IT department, LAN, log in, network, network switch, password, router, Wi-Fi, WLAN	Enquiring about wants/ desires
3	Batteries	Employee handbook	alkaline, battery, battery analyzer, charge, disposal, Li-Ion, mercury, nonrechargeable, rechargeable, recycle, toxic	Asking for information
4	Technology Management	Letter	acquisition, decommission, evaluation, fix, incoming testing, installation, life-cycle cost analysis, replace, software, staff education, technology, update	Asking for permission
5	Physiotherapy Equipment	Repair request sheet	CPM device, extend, flex, hot pack heater, lid, physiotherapy, sequential compression device, temperature adjustor, timer, valve , wax bath, whirlpool bath	Expressing intent
6	Feeding Pumps	Manual	air-in-line detector, enteral, feeding pump, feeding solution, flow rate, nutrition, pass, pressure, pump head, stomach, swallow, throat	Talking about necessity
7	Electroconvulsive Therapy Devices	Textbook	brief-pulse current, contract, ECG, ECT, EEG, electrode, indicator, motion-sensing device, operator, twitch	Politely interrupting
8	Testers 1	Catalogue	centrifuge, digital multimeter, ESU analyzer, manometer, oscilloscope, oxygen analyzer, performance assurance test, power output, RF leakage, sound-level meter, tachometer	Expressing uncertainty
9	Testers 2	Textbook	arrhythmia, calibrator, gas-flow analyzer, incubator analyzer, infusion device analyzer, NIBP analyzer, physiological simulator, SpO ₂ analyzer, test lung, ultrasound analyzer, ventilator analyzer	Describing possible consequences
10	Tools and Accessories 1	Job list	adjustable wrench, Allen, cutters, hammer, Phillips, pliers, screwdriver, slotted, socket set, socket wrench, spanner, tip, Torx	Giving a reminder
11	Tools and Accessories 2	Email	adhesive, box cutter, chip contact extender, contact cleaner, heat-shrink tubing, integrated circuit removal tool, micrometer caliper, sealant, solvent, spray lubricant, stereomicroscope, tape measure	Giving approval
12	Power Tools	Advertisement	bench grinder, bit, circular saw, cordless drill, drill press, hammer drill, power tool, reciprocating saw, sander, workshop	Stating a preference
13	Soldering	Manual	face shield, handle, holder, power supply, reservoir, safety goggles, smoke removal system, solder, solder sucker, soldering station, soldering tip, unsolder	Enquiring about knowledge
14	Troubleshooting	Guide	code, diagnose, duplicate, manufacturer, note, evidence, replace, return, service contract, service manual, tech support, troubleshoot, warranty	Giving advice
15	Future of the Industry	Magazine article	advance, aging, career, demand, expand, FSE, growth, ISO, OEM, on call, rely on, role, specialist, technological	Expressing interest

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Get ready!

1 Before you read the passage, talk about these questions.

- 1 What sorts of tasks should a biomedical engineering technologist expect to complete?
- 2 What sort of training is involved in becoming a biomedical engineering technologist?



Lincoln
Medical Center
Jobs Directory

Job Summary: BMET

needed to **maintain** medical equipment at Lincoln Medical Center. He or she must be detail-oriented. Applicants must have basic skill set, such as **calibrating** equipment. We **train** employees on some specific hospital equipment.

Essential Responsibilities: Technologists will check and repair medical **devices**. These include EKG and EEG machines. The technologist will **inspect** medical equipment for wear and **repair** damages. Technologists also **assess** and **install** new equipment.

Requirements: The technologist must have an Associate's degree in biomedical technology.

Reading

2 Read the job posting. Then, mark the following statements as true (T) or false (F).

- 1 ___ The BMET must know how to calibrate machines.
- 2 ___ Some devices will require extra training for new BMETs.
- 3 ___ Technologists will check if medical personnel install equipment correctly.

Vocabulary

3 Write a word that is similar in meaning to the underlined part.

- 1 The technician needed to observe and make judgments on the situation before proceeding.
a _ _ e _ s
- 2 Before the procedure, they wanted to check the stopwatch's measurements against a standard.
_ _ l _ b r _ _ e
- 3 Because the problem was something to do with her biological processes, they had to see a doctor.
m _ d i _ _ l
- 4 The landlord had to regularly upkeep the apartment building's air conditioning units.
_ a _ _ t _ _ n

4 Read the sentence pairs. Choose which word best fits each blank.

1 **inspect / train**

- A The BMET wanted to _____ the device by looking at it.
- B You can _____ a BMET by showing her the steps to maintain medical technology.

2 **repair / install**

- A He dropped the medical device down the stairs and had to _____ it.
- B The woman decided to _____ the monitor next to the hospital window.

3 **BMET / device**

- A The girls used a _____ to measure the weight of the screws.
- B The engineering student is training to be a _____.

- 5 Listen and read the job posting again. What are some desirable qualities of a BMET?

Listening

- 6 Listen to a conversation between the interviewer and an applicant. Mark the following statements as true (T) or false (F).

- 1 ___ The applicant has worked at a hospice.
- 2 ___ The man does not know how to repair heart monitors.
- 3 ___ The applicant has worked several jobs in the industry.

- 7 Listen again and complete the conversation.

Interviewer: It says on your resume that your last job was at a 1 _____.

Applicant: At Sunnydale, I handled repairs of 2 _____ and life support systems.

Interviewer: Did you enjoy the work?

Applicant: I have a 3 _____ for mechanics.

Interviewer: Have you been 4 _____ equipment for long?

Applicant: The job at Sunnydale was my 5 _____. However, I was trained well.

Interviewer: Does that 6 _____ you to work here?

Applicant: Absolutely. I enjoy repairing machines and I'm also very good at it.

Speaking

- 8 With a partner, act out the dialogue from Task 7. Then switch roles.

USE LANGUAGE SUCH AS:

What makes you qualified ...?

I've studied ...

I mainly repaired ...

Student A: You are an interviewer. Talk to Student B about:

- the information on your his or her resume
- his or her qualifications for the position
- his or her previous job experience

Student B: You are an applicant. Talk to Student A about your experience as a BMET.

Writing

- 9 Use the conversation from Task 8 to complete the job interview notes.

Date: _____

Name of Applicant: _____

The applicant has studied _____.

The applicant worked _____ and has experience _____.

The applicant repaired life support systems.

The applicant has a passion for mechanics and enjoyed their previous job.

Would you hire the applicant? **Y** / **N**

JOB INTERVIEW NOTES

Glossary

- **hundred** [N-COUNT-U7] **Hundred** is combined with another number to abbreviate numbers in the thousands. For example, the number 1,400 could be said “fourteen hundred.”
- AC power cord** [N-COUNT-U10] An **AC power cord** is a coiled wire used to transmit alternating currents to electronic devices.
- add** [V-T-U7] To **add** a number to another number is to increase it by that amount.
- anesthesiologist** [N-COUNT-U4] An **anesthesiologist** is a doctor who puts people to sleep for surgery.
- antibiotic** [N-COUNT-U14] An **antibiotic** is used to kill or slow the growth of bacterial microorganisms in the body.
- antimicrobial** [ADJ-U14] If something is **antimicrobial**, it kills or prevents the growth of microorganisms such as bacteria and fungus.
- assess** [V-T-U1] To **assess** something is to gauge the quality of it, or to observe it in order to make a judgment.
- associate's degree** [N-COUNT-U15] An **associate's degree** is an undergraduate degree awarded at junior and technical colleges, typically for a course of study lasting two years.
- bacteria** [N-PLURAL-U14] **Bacteria** are single-celled microorganisms that inhabit all areas of the earth including human bodies. Many types of bacteria are responsible for human ailments and diseases.
- biohazard** [N-COUNT-U14] A **biohazard** is a biological substance that is potentially harmful to humans. Biohazards can include bacteria, viruses, and biologically derived toxins.
- Biomedical Engineering Technologist (BMET)** [N-COUNT-U1] A **Biomedical Engineering Technologist (BMET)** is a scientist who applies engineering to the development of medical technologies.
- blood oxygen content** [N-UNCOUNT-U13] **Blood oxygen content** is the amount of oxygen saturated in the blood.
- blood pressure** [N-UNCOUNT-U13] **Blood pressure** is the measure of the force exerted by the blood on blood vessels' walls.
- blow** [V-I-U12] To **blow** is to suddenly fail.
- BMD** [N-UNCOUNT-U15] **BMD** is the biomedical electronics technician certification licensed by the Electronics Technician Association.
- broken** [ADJ-U11] If an object is **broken**, it is not functioning properly.
- cable** [N-COUNT-U10] A **cable** is a thick rope of fiber or bound, insulated wire used to conduct electricity.
- calibrate** [V-T-U1] To **calibrate** an instrument is to adjust its qualities to match those of a standard.
- cardiologist** [N-COUNT-U4] A **cardiologist** is a doctor who takes care of patients with heart problems.
- cardiology** [N-UNCOUNT-U3] **Cardiology** is the hospital department that specializes in the treatment of the heart and heart diseases.
- CBET** [N-UNCOUNT-U15] **CBET** (Certified in Biomedical Electronics Technology) is the title awarded to those who have completed a BMD.
- Celsius** [N-UNCOUNT-U9] **Celsius** is a scale for measuring temperatures and establishes the freezing point of water at 0°C.
- centimeter** [N-COUNT-U9] A **centimeter** is a metric unit of distance equal to about 1/100 meter or about 0.39 inches.
- central station** [N-COUNT-U13] A **central station** is the main monitor that collects readings from all other monitoring equipment.
- certification** [N-UNCOUNT-U15] **Certification** is the act of being authorized to perform a particular art.
- CET** [N-UNCOUNT-U15] **CET** is the electronic technician certification licensed by the Electronics Technician Association.
- chemical** [ADJ-U6] If something is **chemical**, it is related to the properties or interactions of chemicals.
- Chemistry** [N-UNCOUNT-U15] **Chemistry** is the study of matter.
- CLES** [N-UNCOUNT-U15] **CLES** certification is that which covers the maintenance of all laboratory equipment.
- clog** [N-COUNT-U12] A **clog** is any item that may hinder action or impede motion.
- CNES** [N-UNCOUNT-U15] **CNES** certification is that which focuses specifically on the maintenance of nephrology and hemodialysis equipment.



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MEDICAL EQUIPMENT REPAIR

Career Paths: Medical Equipment Repair is a new educational resource for emergency responders and managers who want to improve their English communication in a work environment. Incorporating career-specific vocabulary and contexts, each unit offers step-by-step instruction that immerses students in the four key language components: reading, listening, speaking, and writing. *Career Paths: Medical Equipment Repair* addresses topics including hospital departments, IV pumps, infant care equipment, testers, and soldering.

The series is organized into three levels of difficulty and offers a minimum of 400 vocabulary terms and phrases. Every unit includes a test of reading comprehension, vocabulary, and listening skills, and leads students through written and oral production.

Included Features:

- A variety of realistic reading passages
- Career-specific dialogues
- 45 reading and listening comprehension checks
- Over 400 vocabulary terms and phrases
- Guided speaking and writing exercises
- Complete glossary of terms and phrases

The **Teacher's Guide** contains detailed lesson plans, a full answer key and audio scripts.

The **audio CDs** contain all recorded material.



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