EVALUATING
ACADEMIC READINESS
FOR APPRENTICESHIP TRAINING
Revised for
ACCESS TO APPRENTICESHIP

COMMUNICATIONS SKILLS
COMPARISON OF INFORMATION

AN ACADEMIC SKILLS MANUAL
for
The Small Motors Service Trades

This trade group includes the following trades:
Marine & Small Powered Equipment Mechanics,
Motorcycle Mechanics, and
Small Engine Mechanics

Workplace Support Services Branch
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In preparing these Academic Skills Manuals, we have used passages, diagrams and questions similar to those an apprentice might find in a text, guide or trade manual.

This trade related material is not intended to instruct you in your trade. It is used only to demonstrate how understanding an academic skill will help you find and use the information you need.

COMMUNICATIONS SKILLS
COMPARISON OF INFORMATION

An academic skill required for the study of the Small Motors Service Trades

INTRODUCTION

You make comparisons on the job every day. You compare size when you pick one size of bolt instead of another. You compare techniques when you decide to use one type of power tool instead of another. You compare long-term costs when you order a better quality replacement engine because it is more durable than a less expensive one.

*When you make a **comparison**, you examine two or more things to find out how they are similar and how they are different.* While comparison examines both similarities and differences, contrast only looks at differences. Once you have made your comparison or contrast of the different options available, you are in a position to evaluate what is the best choice for a given situation.

In your trade, you compare products and equipment for a variety of reasons: to decide which one is more durable, which is safer or which will work better in a specific situation. You learn to compare techniques and procedures through your reading, from listening to teachers, supervisors and skilled tradespeople, and through your experience on the job.

In this skills manual, we will look at the following aspects of comparison:

- How comparison works
- Language that compares and contrasts
- Using text and graphics to compare
- Making choices

PART I
HOW COMPARISON WORKS

From general to specific

Most comparisons start with general information about a topic. This general information is your base. The topic could be anything from engines to tools. From this foundation, you move to more specific topics such as what size engine you need for different lawnmowers or the safe use of a power drill.

As you read about a topic such as lawnmowers, you begin with explanations, definitions or descriptions that apply to the large body of information about this kind of machine. This gives you an overview of the topic.

From this general information, you learn more specific information such as types of mowers. As you learn the characteristics of each type, you see what the various mowers have in common and how they differ.

Next, you sort out the similarities and differences between:

- features of different mowers
- recommended uses of each type

You *compare* features, operation, procedures, conditions or costs related to the large group and to each item in the group. You can then compare the advantages or disadvantages of each. You are in a good position to choose the best method or product for a specific job.

Passage 1 shows you this typical pattern of moving from general to specific information. It starts with general information about lubricants. It then describes a type of lubricant, grease, and goes into detailed comparison of different soap greases.

Read Passage 1. As you read, pay attention to how using comparison leads you to understand the concepts.

Passage 1
Lubricants

Lubricants are substances such as oil, grease or graphite used on surfaces which slide or move against each other. Lubricants reduce friction and wear between components and increase their life.

Properties of Grease
Lubrication oils are thickened with a soap to produce greases. Adding thickener controls water resistance and thus resistance to machine breakdown resulting from constant use and temperature range. The grease also is better able to stay in place. The content of soap in *general purpose greases* is usually from 7% to 18%; for *special purpose greases* the range can be from 3% up to 50%.

Grease Types
Simple Soap Greases combine a fatty acid with a base metal (calcium, sodium, aluminum, lithium or barium).

Calcium soap: a small amount of water stabilizes this oil/soap structure. At temperatures of approximately 80^0C (175^0F), the soap and oil separate as the internal water works out. These greases are suitable for damp conditions but not for high temperatures.

Sodium soap: Soluble in water. High temperature range. These soaps are recommended only for dry conditions and high operating temperatures.

Aluminum soap: Used where adhesiveness is important because of stringy quality. Water-resistant; not recommended for high temperatures.

Lithium and Barium soaps: The most commonly used soap greases . . . Etc.

Mixed Soap Greases combine various types of soaps to increase the service life of a grease. A mixture of calcium and sodium soaps offers water resistance . . . Etc.

When you read Passage 1, it doesn't say anywhere that types of greases will be compared but this is what is happening. We will look at Passage 1 in more detail to see how the comparison is organized.

In paragraph one, you learn:

- *what* lubricants are: substances such as oil, grease or graphite;
- *where* they are used: on surfaces which slide or move against each other; and
- *why* they are used: [to] reduce friction and wear between components

The answers to *what, where, and why* are the type of questions that you could answer from this description. This description applies to all lubricants.

The next paragraph provides information about a specific type of lubricant – grease. The characteristics, advantages, and limitations of grease are described. The passage tells you:

- how machine grease is made;
- the effects of adding thickener and
- the percentage of soap in two types of grease

This description applies to all greases. This is how they are the same. For specific comparisons, you have to read on. Paragraphs three to eight provide details about simple soap greases:

- similarities and differences in use and composition of different soap greases
- which grease to use in different situations

By comparing and contrasting such things as composition and use, you can find out which item is suitable or recommended for a specific application.

Using the information

When you learn about materials such as lubricants, you get information and details that enable you to make comparisons. You could explain to someone else what to expect if you substituted one type of grease for another. Comparing greases can also show why an inappropriate choice, such as using sodium soap at low temperatures, could produce an unsuitable outcome, such as the grease thickening too much.

When you learn about one thing, in this case, greases, you will probably go on to learn information about the features and use of other lubricants. Be prepared to think about their similarities and differences. Consider making your own list of advantages and disadvantages so you have a handy reference.

Classification

An important method of comparison is *classification*. ***Classification is a method of grouping things according to their similarities***. Classifying materials, tools and techniques is a good way to keep organized. Classification can help you see how things are related and how they differ.

Read **Passage 2** below to see how this works.

Passage 2
Simple Machines

A *machine* is a device that makes work easier by changing the speed, direction or amount of force. A *simple machine* magnifies the effects of an applied force.

Levers
Levers are the simplest of basic machines. The point where the lever pivots is the *fulcrum* of the lever. There are three classes of levers:

Class 1: These levers have a fulcrum between the resistance force (load) and the effort. Crowbars, bolt-cutters, jacks, pliers and scissors are all examples of Class 1 levers.
Class 2: The resistance (load) in these levers is between the fulcrum and the effort. If you lift an object by one end, it is a Class 2 lever. Wheelbarrows are an example.
Class 3: The effort in these levers is applied between the fulcrum and the resistance. The effort arm is shorter than the resistance arm, and the effort is always greater than the resistant force. If you use your hand and arm to carry something, this is an example of a Class 3 lever. Cranes, backhoes and hammers are also examples.

Passage 2 sets up comparison in a series of steps. Paragraph one starts with general information:

- It introduces the large classification, *machines*, and defines what a machine is.
- It then describes a more specific classification: *simple machines*.

Then the passage focuses specifically on one type of simple machine – levers.

- You already know what a *simple* machine is or does. You can apply these facts to levers.
- You learn the definition of a lever.
- You also learn there are three classes of levers.

Next, you get a definition for each of the three classes of levers.

- You can compare each of the three types of levers as to:
    - fulcrum points,
    - the relationship between resistance and effort, and
- You are also given examples of each class of lever

By the end of Passage 2 you know how the different classes of levers are similar and how they different. You also know how each type is used.

This description moves you gradually to a more detailed understanding. It is organized so that you build your knowledge gradually. *Comparison through classification* leads you to recognize the ways that something is similar to and different from others in its category. You can then use this information to generalize about how each will function in the workplace.

Tables, charts and lists
Tables, charts and lists are used to organize and compare information. The information is easy to use for comparisons because it is already organized into categories. You will find tables in manuals, texts and on-line.

Tables cover a wide variety of material from metric and imperial measurement to categories of fasteners. You can use tables or lists to organize and compare information such as gear case clearance, spark plugs and carburetors or the advantages and disadvantages of four- and two-stroke engines.

For learning and studying purposes, you can convert information from a text into a list or table. After organizing material into a table, you can quickly recognize differences and similarities between products or techniques. You can also add row or columns to your table as you learn more about the topic.

Read Passage 3, below, about testing electrical systems. Examine the table and see how it compares the hook-ups of different testing meters.

Passage 3
Maintenance and Testing Electrical Systems

The many different electrical systems require you to refer to the service manual for diagnosis and repair. Do a visual check when electrical problems occur.

Because improper meter connections can damage the meter or circuit, carefully read the explanation of proper hookup that follows.

Voltmeter connection: A voltmeter must be connected *in parallel, **not*** in series. It can be used to check voltage at any point in a circuit. Either a high or low reading may indicate circuit problems.

Ammeter connection: An ammeter is always connected *in series.* Current must flow through both the circuit and ammeter. A higher or lower than normal current reading may indicate circuit problems.

Ohmmeter connection: An ohmmeter can be connected *in series* or *in parallel*, but **never** to voltage or current. If connected to a live circuit, it could be damaged as it supplies its own power.

When testing continuity of a wire, no resistance is wanted. When testing continuity in a coil, a certain amount of resistance is common. Compare tested resistance to the specifications in a service manual to determine circuit or component condition.

Meters	**Hook up**
voltmeter	in parallel
ammeter	in series
ohmmeter	in series or in parallel

Table 1 below is a selection chart. *Before* you start, read the headings to see what features, functions or problems are compared. Also read the footnote. Cover all the details.

Look at how Table 1 is organized and what it compares. Answer the questions that follow. Answers are at the end of this skills manual.

TABLE 1 FOUR-CYCLE VS. TWO-CYCLE ENGINES

Characteristics	**Four-Cycle Engine Equal horsepower (hp) One cylinder**	**Two-Cycle Engine Equal horsepower (hp) One Cylinder**
Number of major moving parts	Nine	Three
Power strokes	Four strokes per operating cycle of intake, compression, power, exhaust. Two revolutions of crankshaft complete one four-stroke cycle.	Two strokes per operating cycle of intake, compression, power and exhaust. One revolution of crankshaft completes one two-stroke cycle.
Running temperature	Cooler running.	Hotter running.
Overall engine size	Larger, (camshaft, valves, tappets are necessary).	Smaller, simpler in design.
Versatility	Limited slope operation because engine receives less lubrication when tilted.	Lubrication not affected by angle of operation. Can operate at extreme angles.
Lubrication	Usually splash or pump system.	Fuel-oil mixture passed through engine.
Etc.		

Note: The advantages and disadvantages of any engine are related directly to its application. Any decision about which is better should be made after considering every aspect of its intended use.

Questions:

1. The two-cycle engine size is smaller, but it can deliver horsepower (hp) equal to that of a four-cycle engine.

T F

2. A four-cycle engine compared to a two-cycle will:

a) have fewer major moving parts.
b) deliver greater hp.
c) go through same cycle but with different number of strokes.
d) have a cooler running temperature except for hotter climates.

3. The four-cycle **engine operates** at extreme angles.

T F

4. Four-cycle and two-cycle engines use the same lubrication systems.

T F

Know your purpose
If you need to review the major differences between these engines, you can look across the rows and headings in a table like Table 1. Someone has organized and listed the information. *The table is a comparison in brief,* so you can quickly find information

Comparisons presented in a table have some of the work done for you when you are selecting the most suitable tools, materials and processes. Look carefully to compare the characteristics, details and application. This enables you to make the best choice.

Build from the base up
Comparison comes in a variety of forms - some obvious and some not so obvious. However, the purpose remains the same: *to give you a base and then to show you similarities and differences.*

PART II
WORDS THAT COMPARE AND CONTRAST

In Part II, we look at some of the words and phrases that you can use to recognize when something is being compared or contrasted. Remember, c***omparison*** means both similarities and differences while c***ontrast*** means differences only.

If someone says to you, "I drive the same car as you do," you immediately know a lot about their car. You take what you know about your own car and apply that information to their car.
To compare them thoroughly though, you have to ask some questions. You might compare this type of detail:

- make, model and year,
- engine size,
- colour and condition,
- number of kilometres,

Direct Comparison
Words and phrases that compare and contrast
Some words and phrases immediately signal that a comparison or a contrast is to be made. When a comparison is signaled in this way it is called a ***direct comparison*****.**

Words such as *same, like, similar,* and *all* tell you about something and compare it to something else. And, note the different ways of saying *all - whatever the type* and *regardless of the type*.

Examples:
All nuts on this system have right-hand threads.

Screwdrivers, *like any other tool,* are designed for a specific kind of activity. Never use them to pry items loose.

All hard blades are heat treated all over. This makes them very brittle and easily broken if misused.

Some comparisons show similarities, and then point out differences by using words such as *some, many, most, different* and *unlike*. For example, if *most* or *some* snips cut heavier gauge metals, it means that *some others* will not.

Examples:
The carburetor float is a small sealed vessel made of brass or plastic. *Some* carburetor floats are made of solid flotation materials so possible leakage is eliminated.

Piston heads are manufactured in many *different* shapes depending on the type of engine and use.

A *different* fuel system setup is required to supply LPG and natural gas *than* the conventional type used to supply gasoline.

When comparing information, you might have to reread a few times to get all the details.

Examples:
These fires are put out by the same process as TYPE B, but the extinguishing material must be electrically non-conductive.

Recommended spark plugs for all models except 36S2 and 8S3-1 pumps is XXXX.

A DC generator works on the same principle as the alternator. Magnetism is used to induce current in the generator windings; however, a generator differs from a simple alternator in three ways.

Words and phrases such as *while, but, except, unless, on the other hand, whereas, instead of, however* set up comparison, but they point out contrasting or differing uses or applications.

Examples:
The standard micrometer is graduated in thousandths of an inch (.001"). The Vernier micrometer, *on the other hand*, is graduated in ten-thousandths of an inch (.0001").

Right-hand thread is understood, *unless* left-hand thread is specified in the diagram.

The power supply for an electric drill is the electric cord, *whereas* in a pneumatic drill, it is the air hose.

All threads do *not* take equal amounts of loading.

The words *relative* or *relatively* mean compared to each other or to other items.

Examples:
Iron is *relatively* more active than copper.

Some comparison/ contrast words and phrases restrict you, or tell you not to do something. Words like: *only as stated*: *exclusively, excluded,* and *only,* tell you something is allowed or permitted.

Example:
Fluid and air hoses are made *differently* and for this reason should not be interchanged. Study the *different* construction of fluid and air hoses.

Watch for these comparison words and suffixes:

less . . . than	less volatile than gasoline
more . . . than	more brittle than . . .
as. . . as	as much as . . .
___er . . than	harder than steel
___est	strongest

Indirect Comparison
In some cases, a comparison is not obvious.

Example:
Experienced technicians know the advantages of tools of high quality purchased from reputable manufacturers: Most do the following:

- offer lifetime guarantees against failure,
- are made from quality materials,
- hold up under use,
- enable them to do better work.

Although no comparison is stated here, turn the information around to discover indirect comparison. The information indirectly implies that the *opposite* is true about poor quality tools. While you might find other opinions, you could conclude that many poor quality tools:

- **do not** offer lifetime guarantees against failure.
- Are **not** made from quality materials,
- **do not** hold up under use,
- **do not** enable installers to do better work.

Watch for information that is not directly stated. You may have to pull out the details.

Example:
The disadvantage of open-end wrenches is that they only grip two faces of the nut. This rounds off the nuts and may cause injury to hands.

Use comparison and contrast to gather information. If open-end wrenches have these disadvantages, another *more suitable* tool might be available. Select the proper product to avoid problems.

Although we can safely turn some information around, be careful not to jump to conclusions.

Example:
Measuring tools must be handled with **the same care** as other precision instruments.
1. Never drop a square as this can ruin accuracy.
2. Always keep it clean.

Does this mean you can toss around semi-precision instruments and other tools? Before you start dropping your hammers and chisels, think about the consequences to these tools.

Math language
In math, the concepts of *proportion, ratio, decimals* and *percentages* are forms of comparison. Each of these terms is used to compare one amount or measurement to another. They are fundamental to mixing products, determining slope or finding safe bearing weights. They are also used to compare quality, strength of materials and cutting speeds.

Examples:
A ten-tooth gear will make three revolutions for each revolution of a thirty-tooth gear. The large gear will turn at 1/3 the speed of the small gear.

The camshaft/crankshaft rotation for machine reaming is ½ that of HSS.

Discard this if wear on bearing surfaces is more than 10%.

Knots reduce rope strength by half (50%).

PART III
USING TEXT AND GRAPHICS TO COMPARE

Text and graphics often work together to compare different aspects of a relationship. The text explains and gives examples while graphics list items or illustrate specific parts or procedures. When you use both sources of information, they work together to provide you with complete data on which to then base your comparison.

Read Passage 4 and Table 2 below to compare the relationship between distance and pressure in hoses. **Use the text and the table to answer the questions that follow**. **Answers are at the end of this skills manual.**

Passage 4
Hose Size

The proper size and type of hose will deliver air from the compressor and material from its source to air tools and guns.

When air is compressed and travels a long distance, its pressure begins to drop. However, you can keep this pressure drop to a minimum (for a distance up to 100 feet) when you use proper fittings and a hose of the proper diameter.

Table 3 shows hoses of different lengths (5 feet and 50 feet) and different *internal diameters* (1/4 inch up to 3/8 inch). You can compare the pressure drop at different pressures for these hoses. Compare PSIG for 5-foot lengths (column 2) and PSIG for 50-foot lengths (column 3).

At low pressure and short lengths of hose, the drop is not significant. At higher pressure and longer lengths, the pressure drop becomes much greater. It must be compensated for.

TABLE 2: AIR PRESSURE DROP

ID stands for Inner Diameter
PSIG stands for Pounds per Square Inch Gauge

Size of Air Hose (ID)*	5-foot length	50-foot length
1/4 inch @	PSIG ^	PSIG
40 PSIG	0.4	16.0
60 PSIG	4.5	20.0
80 PSIG	5.5	25.0
5/16 inch @	PSIG	PSIG
40 PSIG	0.5	4.0
60 PSIG	1.0	6.0
80 PSIG	1.5	8.0

Questions:

1. Low pressure and short lengths of hose may cause a significant drop in air pressure.

   T F

2. Higher pressure and longer lengths would result in approximately the same drop in air pressure as lower pressures and shorter lengths.

   T F

3. Which of the following would you compensate for?

   a) low pressure and short lengths of hose
   b) higher pressure and longer lengths of hose
   c) higher pressure and hose of proper diameter

4. An inner diameter of 1/4" with a 60 PSIG will experience pressure drop of 4.5 at 5-foot lengths.

   T F

Text and graphics work together

When information is complex, using both text and graphics to compare and contrast helps you *get the whole picture.* Text and graphics – diagrams, tables, charts, illustrations, photos – work together to describe and illustrate what you need to know in order to make good choices.

Read Passage 5 and Table 3, below, to compare the relative activities of metals. Note the language cues and patterns of comparing as you read the passage. **Use the text and the table to answer the questions that follow**. **Answers are at the end of this skills manual.**

Passage 5
Galvanic Corrosion

When two dissimilar metals are in contact with each other, *galvanic corrosion* occurs. The metal that is more chemically active will corrode. See Table 3. For example, zinc will corrode, cover, and thus protect, steel.

TABLE 3: Relative Activity of Metal

Magnesium	**Most Active**
Aluminum	▲
Zinc	
Chromium	
Iron	
Cadmium	
Cobalt	
Nickel	
Tin	
Lead	▼
Copper	**Least Active**

With other metals, galvanic corrosion can cause problems. For example, the coatings on galvanized steel and tin plate are corrosion resistant. If the seams of these metals were welded, the welding process would burn off the protective coating. This would result in a product that fails. For wood-shingled roofs, only rust resistant nails are recommended. Hot-dipped, zinc-coated nails with the strength of steel and corrosion resistance of zinc are recommended.

Questions:

1. According to Passage 4 and Table 5, aluminum is more chemically active than nickel.

   T F

2. If iron and nickel are in contact with each other, the nickel will corrode.

   T F

3. Galvanic corrosion may cause problems even when dissimilar metals are in the *least chemically active* range.

   T F

4. The following will prevent accelerated (faster) galvanic corrosion:

   a) using the least active metals
   b) using specialized (dielectric) fittings
   c) using two dissimilar metals

By comparing what you read and what you see, you are using an important technical tool. When data is simple, you can get what you need from either written text or diagrams. When information is more complex, you usually need both.

PART IV
MAKING CHOICES

To follow steps correctly, to double-check work or to understand a problem, you are constantly making comparisons. Think about how this works. To follow instructions, you have to compare what you are reading in a manual to what you are actually doing. Comparing what is shown in the text to the results in front of you will help you decide if you are on the right track

The list below suggests questions you might ask when you are making a decision:

- What features do these products or methods have in common?
- How do they differ?
- Is one better in certain situations than the others? Why?
- How do costs compare?
- Which is the better choice for my situation? Why?

Passage 6 compares and contrasts features of two types of wrench. **Read the passage and answer the questions that follow. Answers are at the end of this skills manual.**

Passage 6
Wrenches

Box-end wrenches have a closed end for better holding power. The jaws fit completely around a bolt or nut and grip each point on the fastener. The box-end wrench is thus the safest. More force can be applied without slipping and causing damage to the bolt or nut head.

The 6-point wrench is the strongest because it completely surrounds the hex nut and brings force to bear on all six sides and points. The 12-point wrench also grips the six points but does not bear on the face surfaces of a hex nut; this means there is a greater potential for slippage. The advantage of a 12-point wrench is that the wrench can grab the nut in twelve different positions. In confined spaces, the additional engagement points increase the possible turning radius. The handle of a box-end wrench is often offset 10 to 60 degrees to reach into an area without the handle hitting the part.

Questions:

1. Which of the following describes advantages of box-end wrenches?

   a) closed end, offset handle, jaws fit completely around a nut
   b) more force can be applied without slipping, the box-end grips in twelve different positions
   c) both a) and b)

2. In confined spaces, the 6-point wrench will give an increase in turning radius.

   T F

3. Both the 12-point and 6-point wrench have equal grip on a bolt or nut.

   T F

4. Which wrench would you choose for greatest strength?

   a) either 6 or 12-point
   b) 6-point
   c) 12-point

A final point about how comparisons work.
When you start with good basic knowledge about something, you can understand and evaluate the details that follow. You will be ready for each new idea as it is presented. When you know how a tool or fitting works, you can understand why it is designed the way it is. This foundation will also help you decide which tool or fitting to choose.

Once you know how to select the proper size wrench, you are on your way to learning how to remove an engine. Textbooks, manuals and supervisors assume you understand basic information as you move through the course. If you are missing basic information, you may find you can't make effective comparisons as new ideas are presented. *Make sure your basics are sound before going on.*

And remember, a change in a routine or a product might affect the outcome. For example, you might always get 80% or more on tests. If you change the number of hours you study, or skip breakfast, your results may be different. If you compare such cause and effects over a period of time, you learn something about the relationship between behavior and outcome. This can lead you to think about how you make choices in your learning and your job.

CONCLUSION

Information in your texts is set up so you can create a base of knowledge. From your base, you can compare and contrast the different materials, tools, procedures and methods that you have learned.

When reading technical material, look for words that compare and contrast. They can alert you to comparisons. This enables you to make sound choices as to what is most suitable for each situation

Charts and table provide easy ways to compare and contrast because the information is organized into categories.

Principles and measurements may not change but tools, applications, materials, equipment, conditions and seasons do. To adapt to change, compare the old with newer information. This will enable you to keep up to date in the metal trade and have happy employers and clients.

Summary

1. **Understand how comparisons work**:
   - from the large topic to an item by item comparison
   - through classification
   - through tables and charts

2. **Build from a solid base**. If a comparison doesn't make sense, stop and get help before going on.

3. **Look for patterns and language that compare and contrast**. Watch for tables and passages that compare without telling you (indirect comparison).

4. **Use text (written) and diagrams together** to compare information. Use all details available to you.

5. **Change in one area results in change to another area**. Compare details to make the right adjustments to adapt to the change.

6. **Compare what you read with what you do**. It is an important technical tool.

Answer page

PART I Table 1, Four-Cycle vs. Two-Cycle Engines

1. The two-cycle engine size is smaller, but it can deliver horsepower (hp) equal to that of a four-cycle engine.

T The heading over the chart states that engines of ***equal horsepower*** are compared in this table.

2. A four-cycle engine compared to a two-cycle will:
c) go through same cycle but with different number of strokes.

Refer to row 3 and compare the cycle: intake, compression, power and exhaust to number of strokes (4 and 2).

3. The four-cycle engine operates at extreme angles.

F The row labeled **Versatility** states that the four-cycle engine has, "limited slope operation because engine receives less lubrication when tilted".

4. Four-cycle and two-cycle engines use the same lubrication systems.

F The table lists different lubrication systems for these engines. See the row labeled **Lubrication**.

PART II1 Passage 4, Hose Size and Air Pressure Drop

1. Low pressure and short lengths of hose may cause a significant drop in air pressure.

F Although there is a relationship between the two, Paragraph 4 states that this combination would **not** cause a significant drop.

2. Higher pressure and longer lengths would result in approximately the same drop in air pressure as lower pressures and shorter lengths.

F You need to compare low pressure and short lengths to high pressure and long lengths. When you do this, you find the drops in air pressure are different.

3. You would compensate for
b) higher pressure and longer lengths of hose

b) is clearly stated in paragraph 4. Answer c) higher pressure and hose of proper diameter is probably also correct. We don't know, however, what hose diameter would correct the problem.

4. An inner diameter of 1/4" with a 60 PSIG will experience pressure drop of 4.5 at 5-foot lengths.

    T This question asks you to compare information in a question with data in a table to find the right answer.

PART III Passage 5, Galvanic Corrosion and Table 1-4

1. According to Passage 5 and Table 4, aluminum is more chemically active than nickel.

    T Find each metal on Table 4 and compare its position to the other to determine which is least and most active.

2. If iron and nickel are in contact with each other, the nickel will corrode.

    F "Whichever of the two metals is more chemically active will corrode." The more active metal in the table is iron. The nickel, therefore, would not corrode.

3. Galvanic corrosion may cause problems even when dissimilar metals are in the *least chemically active* area.

    T If dissimilar metals are in contact, problems can occur. This is why you are directed to use the same materials for fittings.

PART IV Passage 6, Wrenches

1. Which of the following describes advantages of box-end wrenches?

    a) closed end, offset handle, jaws fit completely around a nut.

2. In confined spaces, the 6-point wrench will give an increase in turning radius.
    F It is stated that a 12-point wrench increases the turning radius. The passage doesn't tell us about a 6-point. This is a question where you will need more information

3. Both the 12-point and 6-point wrench have equal grip on a bolt or nut.

    F Paragraph 2 states that the 6-point surrounds the hex nut. The next sentence states that the 12-point does not bear on face surfaces and has a "greater potential for slippage."

4. Which wrench would you choose for greatest strength?

    b) 6-point. This is stated in paragraph two.