

**EVALUATING  
ACADEMIC READINESS  
FOR APPRENTICESHIP TRAINING**  
Revised for  
**ACCESS TO APPRENTICESHIP**

**COMMUNICATIONS SKILLS  
COMPARISON OF INFORMATION**

**AN ACADEMIC SKILLS MANUAL  
for  
The Horticulture Trades**

This trade group includes the following trades:

Arborist, and  
Horticulturist

*Workplace Support Services Branch  
Ontario Ministry of Training, Colleges and Universities*

*Revised 2011*

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.**

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# COMMUNICATIONS SKILLS

## COMPARISON OF INFORMATION

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*An academic skill required for the study of the  
Horticulture Trades*

### **INTRODUCTION**

You make comparisons on the job every day. You compare one shrub to another to decide which is best for a planting in an acidic soil. You compare techniques when you rototill instead of digging with a shovel. You compare long-term costs when you order cedar instead of pine for a project because it is more durable than the less expensive choice.

*When you make a **comparison**, you examine two or more things to find out how they are similar and how they are different.* Once you have made your comparison, you are in a position to evaluate what is the best choice for the 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. The ability to make comparisons is an important skill to develop. Whether you are comparing tractors or fertilizers, you want the best outcome for each situation.

*Comparison* means examining both similarities and differences. *Contrast* means differences. In this skills manual, we will look at the following aspects of comparison in trade materials:

- ◆ 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. The topic could be lawn mower engines or pruning tools. General information is your base or foundation. From this foundation, you move to more specific topics such as the cutting edges of files or the different types of composters, or the use of a specific power tool. Here you find definitions, descriptions and details about how to care for your tools, and procedures for the proper use of a composter.

As you read about topics such as plastic and wood composters, or mulching and tilling, you learn how each is different from and how each is similar to the other. Moving from the general to the specific gives you an overview of a topic.

Next, you sort out the details about similarities and differences between composter types or cultivating methods. You might move from basic information about what composting is to specific details about methods and materials. 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. It starts with general information about lubricants. It describes one type of lubricant – grease and follows with a comparison of the different kinds of grease.

### **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 that results from constant use and temperature range. The grease is also able to stay in place better. 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°C (175°F), 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.

It is clear what Passage 1 is about. It doesn't say anywhere that 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 paragraphs one and two, we learn the following:

- *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 and increase their life.

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- types of lubricants – grease, its characteristics, advantages, limitations, and so on.

These descriptions apply to all lubricants. This information is a starting point, or a base from which to work. It will be true in all or most situations. For specific comparisons, you have to read on.

We move to a description of grease types in paragraphs three to eight. We learn about:

- similarities in uses, composition and characteristics of different grease types, and
- differences in uses, composition and characteristics.

These paragraphs give you the details to answer these kinds of comparison question:

- Which grease is water-resistant?
- Which would you choose for dry conditions?

You learn that conditions of high temperatures and the presence of moisture will require *different* greases for the right results. And, using comparison, you can discover which grease to use when it is cold or which one to use in wet conditions.

By comparing and contrasting such things as composition and use, you find out which item is suitable or recommended for different applications.

When you learn information about machines, tools or materials such lubricants, you get knowledge that enables you to make useful comparisons. You could explain to someone else what to expect if you substituted one material for another. You might describe how Material A would be cheaper, but Material B would last longer.

By comparing uses and features, you can make the best choice for the given job. Comparing results can also show why an inappropriate process, such as forgetting to lubricate a machine, could produce an unsuitable outcome, such as motor burnout.

As you learn about one thing, in this case, greases, be prepared for information about the features and uses of other materials. Use this information to think about their similarities and differences. Consider making your own list of advantages and disadvantages different products 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 of keeping things organized. It also helps 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 and the effort. Crowbars, bolt-cutters, jacks, pliers and scissors are all examples of Class 1 levers.

**Class 2:** The resistance 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, back hoes and tweezers are examples.

Passage 2 sets up comparison in a series of steps.

1. Paragraph one starts with general information.
  - It introduces the large classification of *machines*.
    - It defines *machine*.
  - It then introduces a more specific classification: *simple machines*.
    - It compares simple machines to all machines and explains what is particular about simple machine in the large category of all machines.
2. Then the passage focuses specifically on one type of simple machine – levers.
  - You already know what a *machine* is or does and what a *simple* machine is or does. You can apply these facts to levers.
  - The details about levers allow you to compare them to both categories – machines and simple machines:
    - they are the *simplest* of basic machines,
    - they all have a *fulcrum*: the point where the lever pivots, and
    - there are three classes of levers.
3. Finally, you get a definition for each of the three classes of levers. Each has a brief description with examples.
  - You learn the relationship between resistant force (load) and the effort force.
  - You can compare each of the three types of levers.
    - Each paragraph shows the similarities in the following:
      - the fulcrum points,
      - the relationship between resistance and effort,
    - You can also see how each class of lever is different:
      - In class one, the fulcrum is between the effort force and the resistance force.
      - In class two, the resistance force is between the fulcrum and the effort force.
      - In class three, the effort force is between the fulcrum and the resistance force.

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 understand how something is similar and different to other things in its category.* You can then use this information to generalize as to how it will function in the workplace.

Passage 3 provides general information about lawn disease. It then gives brief details about two lawn diseases. **Read Passage 3 and answer the questions which ask you to compare these two diseases. The answers are on the last page of this skills manual.**

### Passage3 Lawn Diseases

Identifying the source of lawn problems is crucial since the correct control is different for each cause. Lawns with fine turf grasses (Kentucky bluegrass or creeping bent grass, for example) or those maintained for top quality appearance are more susceptible to lawn disease than typical home lawns.

**Dollar Spot** is a fungus which appears from June to October as bleached, dead, circular spots, 5 to 7 cm in diameter. If serious, the circular spots overlap to create large dead areas of the lawn. Leaf blades develop lesions in the shape of an hour glass with bleached centres and reddish brown borders. In early fall mornings, before dew evaporates, look for fungus growth similar to cobwebs on leaf blades. All grasses are susceptible to dollar spot, (particularly creeping bent grass) especially if nitrogen levels are low. Treat with nitrogen fertilizer; improve air circulation and reduce shade to increase drying rate. Some chemical control may be required when the disease appears, though this fungus may become resistant to particular fungicides.

Early symptoms of **Pythium Blight** are similar to those of dollar spot, but pythium patches are darker grey, and greasy or wet in appearance (especially under wet conditions or in the morning). Depending on day/night temperatures, patches can grow quickly. It affects all turf grass species, particularly creeping bent grass, annual bluegrass and perennial ryegrass. It may affect newly seeded lawns especially under hot, humid conditions, but it is not usual on mature home lawns. The blight is more severe where air circulation and drainage is poor, and where nitrogen levels are high. Avoid watering at night, improve drainage, air circulation, and reduce shade if possible. Avoid nitrogen applications which will encourage lush growth in summer. No chemical control required.

#### Questions:

1. According to Passage 3, which treatment could be used for both dollar spot and pythium blight?
  - a) Reduce shade and reduce nitrogen levels.
  - b) Apply chemical controls and avoid night watering.
  - c) Improve drainage and air circulation.
2. Dollar spot and pythium blight are similar fungi.

T F

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3. Which of the following statements **does not** apply to both dollar spot and pythium blight? In other words, which is **not true**?
    - a) Symptoms for both diseases are similar in the early stages.
    - b) Low levels of nitrogen create conditions for the fungi growth.
    - c) Growing conditions improve if drying time for grass is speeded up.
  4. All turf grasses are likely to be affected by dollar spot and pythium blight.

### T F

It is a standard work practice to compare *what you are doing* to *what you observe*, and to the *information you are reading*. For example, you should compare what you see to what you have read before you decide on a turf grass treatment. When you make comparisons like this, you learn how to respond to each situation. Just as importantly, you could explain to a customer why you are choosing a certain product or a control method.

As you learn about one thing – in this case, lawn disease – be prepared for information about features, life cycles and control methods of other types. Be prepared to think about similarities and differences. Once again, consider making your own list of this material as a handy reference.

### 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 contain a wide variety of material from metric to imperial measurement, types and features of grass seed or uses and strengths of various fertilizers.

For study and learning purposes, if you convert the details from Passage 3 into a list or chart form, you can find differences and similarities quickly. Here is an example

**Lawn Fungi**

Name	Treatment	Appearance
Dollar Spot	<ul style="list-style-type: none"> <li>• nitrogen fertilizer *</li> <li>• improve air circulation, reduce shade to increase drying</li> <li>• may require chemical control</li> <li>• may become resistant to certain fungicides **</li> </ul>	June – Oct <ul style="list-style-type: none"> <li>• bleached, dead, circular spots, 5 to 7 cm in diameter.</li> <li>• Serious if circular spots overlap to create large dead areas of the lawn.</li> <li>• Leaf blades develop lesions in the shape of an hour glass with bleached centres and reddish brown borders.</li> <li>• In early fall mornings, before dew evaporates, look for fungus growth similar to cobwebs on leaf</li> </ul>
Pythium Blight	<ul style="list-style-type: none"> <li>• avoid watering at night,</li> <li>• improve drainage, air circulation, and reduce shade</li> <li>• avoid nitrogen applications</li> <li>• no chemical control required.</li> </ul>	<ul style="list-style-type: none"> <li>• early symptoms similar to dollar spot, but patches are darker grey, and greasy or wet in appearance (especially when wet).</li> <li>• patches can grow quickly</li> </ul>

**Note:** \*See application details and manufacturer's guides on fertilizers.

\*\*See guides for resistance to chemical applications.

You can also add information or columns to your list as you go:

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: Purity and Viability of Turf grass Seeds and Seeding Information**

Turf grass	No. Seeds/gram (approx)	Seeding Rate lb/1000 ft <sup>2</sup>	% Minimum Purity (by weight)	% Minimum Germination (by number)
Bahia grass	360	6-8	70	70
Bent grass, colonial	18 000	0.5-2	95	85
	14 000	0.5-1.5	95	85
creeping redtop	11 000	0.5-2	90	85
Bluegrass, Canada	5 500	1 - 2	85	80
	4 800	1 - 2	90	75
Kentucky rough	5 600	1 - 2	90	80
Fescue, meadow red	500	4 - 8	95	85
	1 200	3 - 5	95	80
sheep	1 200	3 - 5	90	80
Gramma grass, blue	2 000	1 - 2	40	70
Etc.				

**Notes:** *Purity* is the percentage of pure seed of an identified species or cultivar in each seed lot.

*Viability* is the percentage of live seed that will germinate under laboratory conditions. This may be different than actual germination in the field as seeds may lose viability through storage, through planting at unfavourable depths, unfavourable temperatures or moisture. After germination, losses can also occur through disease, insects, erosion, weed competition and traffic.

Percentage of pure live seed (PLS) is calculated by multiplying: *percentage purity* X *percentage viability* = PLS.

Different turf grasses can then be compared for yield and cost per pound.

**Questions:**

- Table 2 shows that redtop bent grass and Canada bluegrass contain nearly the same percentage minimum seed purity by weight.

**T F**

- The greatest percentage difference in minimum purity by weight is between:
  - blue grama grass and bahia grass
  - bahia grass and creeping bent grass
  - blue gramagrass and red fescue

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3. Table 2 shows that colonial bent grass will always have higher germination (viability) than bahia grass.

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4. By comparing the number (no.) of seeds per gram, you can assume that red fescue would be a better buy than meadow fescue.

T      F

If you need to compare grass seeding rates to select the appropriate one, you look in a table like Table 1. It has already done the *comparison* work for you. The table lists the types and features to ensure that you choose the correct seeding rate for the type of grass you are using.

This and other charts can do some of the work for you, but if you need to know *why* one choice is better than another, you will need information from a manual or grower's guide.

### **Know your purpose**

If your purpose is to understand the differences in viability of grass seeds, you can look across the rows and headings in Table 1 to compare them. Someone has done this comparison and then listed the information. *The table is a comparison in brief*, so you can quickly find information.

Careful comparison of features or details should provide enough information to select the most suitable tools, materials or processes. Look carefully at charts that compare features, details, and applications. This allows 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 of knowledge and then to show you similarities and differences*.

## ***PART II***

### ***LANGUAGE THAT COMPARES AND CONTRAST***

In Part II, we look at some of the words and phrases that prepare you to compare things. Remember, *comparison* means both similarities and differences while *contrast* 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 or examine their car. You might compare these types of details:

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

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## Direct Comparison

### It's nice when they tell you

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*, and *all* tell you about something and compare it to something else. Also note the different ways of saying *all* such as: *whatever the type* and *regardless of the type*

#### Examples:

The *same* type of gas is used for both two-cycle and four-cycle engines.

*All* pesticides sold and used in Ontario must be registered under the federal Pest Control Products Act and must be classified.

Do not use the *same* sprayer used for weed killer for insecticides or fungicides because *some* of the weed killer will remain on the sprayer.

Like organic matter, clay colloids function as reservoirs of plant nutrients.

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

Some comparisons show similarities, then point out differences. using words such as *some*, *many*, *most*, *different* and *unlike*. For example, if garden and lawn soils in *most* new subdivisions are deficient in phosphorus and potassium, *some* will not be deficient.

#### Examples:

*Pink snow mould* is *similar* to grey snow mould with some differences. It also appears in patches, but patches are distinct from the grass and they are orange to reddish-brown ...

*Most* borers attack trees and shrubs which have been stressed by something else although some attack healthy trees and shrubs.

*Many* viruses survive from one season to the next in tubers, corms, or sometimes in seed.

Ammonium nitrate and calcium nitrate provide a source of nitrogen in chemical fertilizers. *However*, ammonium nitrate dissolves more quickly in moist soils. This could cause damage.

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

#### Examples:

These products are toxic and must be used *only* for the purposes listed on the product label and only in the manner described.

Fertilizers should be *excluded* for this use *if* fertility levels *do not* require it.

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

#### Examples:

A richer mixture is needed to start *while* a leaner mix is for normal running.

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The ladybird beetle cannot control outbreaks *unless* the insects are non-mobile. *On the other hand*, predators which are beneficial are found naturally in Ontario.

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 also for these comparison words:

less . . . than	A soldered joint on flat metal will provide less strength than a welded joint.
more . . . than	Snow mould is usually <i>more</i> severe in areas with consistent snow cover or in areas where cover is longer than three months.
as . . . as	The way you store fuel is <i>as important as</i> the kind you use.
___er . . than	Diesel fuel is cheaper and diesel engines usually last <i>longer than</i> gas engines.  Duct tape is thicker than masking tape and provides more surface protection.
___est	The best way to cut rigid and flexible copper is with a tubing cutter.

**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, and
- enable them to do better work.

Although no comparison is stated here, turn the information around to discover the indirect comparison. The information indirectly implies that the *opposite* is true about poor quality tools. While you might later 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,

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 should be available.

### **Math language**

In math, the terms *proportions ratios, decimals* and *percentages* are forms of comparison. Each compares one amount or measurement to another. They are fundamental to mixing products or understanding grades of fertilizer.

#### **Examples:**

You will need a 10-6-4 fertilizer for this application. This contains 10% nitrogen, 6% phosphate and 4% potash.

Seed Kentucky bluegrass at a rate of 1 lb per 1000 square feet.

## ***PART III*** ***USING TEXT AND GRAPHICS TO COMPARE***

Text and graphics often work together to compare parts of a relationship. The text explains and provides examples while graphics list or illustrate specific parts of the information. When the text asks you look at a figure, diagram, table, or chart, it is important that you do so. When you use both sources of information, they work together to provide you with complete data on which to base your comparison.

Read Passage 4 and Table 2 below to compare how the size of nozzle opening and the amount of pressure affects the rate of flow. **Use the text and the table to answer the questions that follow. Answers are at the end of this skills manual.**

### **Passage 4**

#### **Nozzles: Flow and Droplet Size**

Nozzles break liquids into droplets, spread the droplets in a pattern and help regulate the rate of flow. Flow rate depends on two things: size of nozzle opening and spray pressure. Flow rate increases with pressure, but the pressure increase must be large – four times the increase in pressure results in approximately two times the increase in flow rate.

Droplet sizes, measured in microns\*, range from very small to large. See Table 3. The number of fine droplets increases as the spray pressure is increased. At low pressures, low-volume nozzles produce very few, fine droplets (about 15% by volume). The proportion of fine droplets increases rapidly as the pressure increases over a certain amount.

Coverage is better with fine droplets and is more cost efficient. However, spray drift also increases, and evaporation and wind may have a greater effect. Drift can be reduced by reducing spray pressure which increases droplet size and makes them heavier. They are less affected by wind and evaporation. The nozzle can also be changed to one which produces a larger droplet.

\*One micron is equal to 1/1000 millimetre.

**Table 2: Average Droplet Size for Pesticide Uses**

Category	Average droplet size in microns	Uses
Aerosol	1-50	Ultra-low volume applications
Mist	50-100	High pressure sprays
Fine spray	100-200	Flat Fan nozzles, for low volume applications
Medium spray	250-400	Flat Fan, for moderate volume, for low toxicity pesticides, for applications requiring good coverage
Coarse spray	400-600	Flooding nozzles, for large volume, for more toxic pesticides, for reducing spray drift

**Note:** Read the manufacturer's tables listing flow rates for different pressures. If liquids, *other than*, water are used, flow rates will be different. Read pesticide labels for volume of spray per unit area. Herbicides, fungicides and insecticides are *not* applied at the same volume of spray per unit area.

**Questions:**

1. Increased spray pressure results in an increase in the number of fine droplets.

**T F**

2. The average size of droplets produced by a fine spray is about one half the size of droplets produced by a coarse spray.

**T F**

3. Which of these situations could create a problem requiring you to make an adjustment?

- a) Low pressures and low-volume nozzles.
- b) Heavy droplets and the effects of evaporation.
- c) Fine droplets and the effects of wind.

4. Which of the following statements is true?

- a) If the pressure increases a certain amount, the flow rate will increase by the same amount.
- b) Different liquids have different flow rates.

**Text and graphics work together**

Information in text and graphics (diagrams, tables, illustrations, photos, etc.) works together to describe and illustrate information. Passage 4 explains a relationship while the table gives the correct data.

The table makes it easier to find and compare details. You can see the direct relationship between length and pressure drop - the longer the length (distance), the greater the drop in pressure. You easily can see that a change in one thing affects or changes something else.

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When information is more complex, using both text and graphics to compare and contrast helps you *get the whole picture*.

## **PART IV** **MAKING CHOICES**

To follow steps correctly, to double-check work or to understand a problem, you will use comparison of information to make choices.

Think about how this works. To follow any instruction, you have to compare what you are reading to what you are doing. Making comparisons will help you make choices, and that means all of your questions have to be answered before you make your choice.

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 5 compares good soil structure to poor soil structure. **Read the passage and answer the questions that follow. Answers are at the end of this skills manual.**

### **Passage 5** **Soil Structure**

Soil structure refers to the way the particles of soil clump or cling together in larger units (called soil *aggregates*) which hold water and nutrients. Structure can range from sandy soils which really have no structure to massive soils which are a solid mass sticking together. The many different kinds of structure range in their ability to allow water, air and roots to move through the soil. Soil structure can be improved with additions of organic matter such as peat moss, manure, or compost. The roots of grass can break up clumps, release substances that promote bonding of smaller aggregates, and can provide organic matter.

Well-structured soil has small aggregates and is easy to work. It influences permeability, holding nutrients while allowing excess water to flow through the air between aggregates and drain away. Good soil crumbles when dug with a fork or spade. Poor soil structure reduces root growth of seedlings and this reduction makes them more susceptible to drought. It also compacts after a rain or when walked on which leads to poor permeability and less oxygen. It can be identified, when forked or spaded, by its flat surfaces and sharp corners.

#### **Questions:**

1. You could say that the structure of sandy soils is preferable to massive soils.

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2. You could correct poor soil structure by which of the following:
    - a) the addition of sandy soil
    - b) the addition of organic matter
    - c) by reducing the bonding of small aggregates
  
  3. Which of the following is **not** a characteristic of poor soil structure?
    - a) It is made up of small aggregates and crumbles when dug.
    - b) It has clumps which stick together when dug.
    - c) It produces poor seedlings but good grass.

### **A final point about how comparisons work.**

When you start with a good basic knowledge of something, you can understand and learn the details that follow. That is, when you understand what a tool or fitting does, you can understand how and why it is designed the way it is and why it works the way it does. You will be ready for each new idea as it is presented.

Once you know understand the make-up of a lubricant and what a machine does, you can understand which grease to choose. Textbooks, manuals and supervisors assume you understand the information as you move through the course. If you do **not** understand it, or if you miss a point, *get help before going on.*

Always 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 results 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 your choices in your learning and your job.

### **CONCLUSION**

Information in your texts is structured so you can create a base of knowledge. From your base, you can compare and contrast the different materials, tools and procedures 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 tables 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 small motors service trades 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 continuing.
- 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.
- 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 reading tool.

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**Answer page**

**PART I      Passage 3, Lawn Diseases**

1. According to Passage 3, which treatment could be used for both dollar spot and pythium blight?

c) Improve drainage and air circulation.

This question asks you to compare the treatment for two different lawn problems to find common solutions. Find the sentences in Passage 1 where the treatment for each is described. You can reduce shade for both, but each requires a different nitrogen treatment so eliminate Answer a). No chemical control is recommended for pythium blight, so eliminate Answer b).

2. Dollar spot and pythium blight are similar fungi.

**F** Compare the descriptions of the two diseases. Dollar spot is identified as a fungus, but pythium blight is not called a fungus. It states that *early symptoms* of pythium blight *are similar to dollar spot*, but this is not the same as saying the disease is similar. Further reading will help you differentiate between these two diseases.

3. Which of the following statements **does not** apply to both dollar spot and pythium blight? In other words, which is **not true**?

b) Low levels of nitrogen create conditions for the fungi growth.

The answer to question 2 will help you eliminate Answer a) as early symptoms **are** similar. Improved air circulation (which speeds up drying time) applies to both diseases, so eliminate Answer c). Different diseases have different causes and require different solutions.

4. All turf grasses are likely to be affected by dollar spot and pythium blight.

**T** Paragraph one states which turf grasses are more susceptible. Both paragraphs two and three state that *all turf grasses* are susceptible and state which are most susceptible to each disease.

**PART I      Table 1, Purity and Viability of Turf grass Seeds and Seeding Information**

1. Table 2 shows that redtop bent grass and Canada bluegrass has nearly the same percentage minimum seed purity by weight.

**T** This is a simple comparison. Find the column comparing the percent of pure seed and compare the two turf grasses. Redtop bent grass is 90% pure by weight while Canada bluegrass is 85%. This seems pretty close – especially if you compare the other rates.

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2. The greatest percentage difference in minimum purity by weight is between:  
c) blue grama grass and red fescue

Use the same process here to find the percentage and then compare for greatest difference. Blue grama grass has the lowest percentage (40%) while red fescue has the highest (95%).

3. Table 2 shows that colonial bent grass will always have higher germination (viability) than bahia grass.

**F** This question is a reminder to read everything available to you. Table 2 shows the different percentages for colonial bent grass at 85% and bahia grass at 70%. The **footnote** explains that viability is determined *under laboratory conditions*. These are not the conditions you will encounter. The table also states that viability may be different (reduced) because of disease, storage, insects and so on.

4. By comparing the number (no.) of seeds per gram, you can assume that red fescue would be a better buy than meadow fescue.

**F** Question #3 has probably prepared you for this. The difference in number of seeds between the two products is more than two times, but there is not enough information here to explain growing conditions or cost to determine which to recommend. You can't guess at an answer.

**PART III**      **Passage 4, Nozzles: Flow Rate and Droplet Size**  
                    **Table 2: Average Droplet Size for Pesticide Uses**

1. Increased spray pressure results in an increase in the number of fine droplets.

**T** This relationship is directly stated in Paragraph two.

2. The average size of droplets produced by a fine spray is about one half the size of droplets produced by a coarse spray.

**F** Find this comparison on Table 3 in the first and second columns. State False for this reason: You are comparing the ranges of size here. The smallest droplet sizes are 100 microns for fine spray and 400 for coarse spray. That is 1/4 the size. Compare the largest drop sizes: fine spray (200 microns) to coarse spray (600 microns). The largest fine droplets are 1/3 the size of the largest coarse droplets.

3. Which of these situations could create a problem requiring you to make an adjustment?

c) Fine droplets and the effects of wind.

Paragraph three tells us that while coverage is better and more cost efficient with fine droplets, wind has a greater effect on them than it does on heavier droplets. This problem should be reduced by reducing pressure (making an adjustment).

4. Which of the following statements is true?

- b) Different liquids have different flow rates.

The answer is in the footnote. *If liquids, other than, water are used, flow rates will be different.*

**PART IV Passage 5, Soil Structure**

1. You could say that the structure of sandy soils is preferable to massive soils.

**F** You need to assess soils for structure and texture. The two soils appear to be the extremes of the range of type, but the passage does not state which is preferable or whether each type is a problem which requires addition of matter.

2. You could correct poor soil structure by the following:

- b) the addition of organic matter

Different soils provide different growing conditions. If soils can be improved, you need to know how to do this. Several examples of organic matter (peat moss, compost or manure) are suggested. Answers a) and c) are not suggested as solutions for *poor soil structure*.

3. Which of the following is **not** a characteristic of poor soil structure?

- a) It is made up of small aggregates and crumbles when dug.

You need to identify soil to assess growing conditions. You also need to recognize what a soil will **not** provide. Answer b) is a characteristic of poor structure; Answer c) is, at least partly true. Poor soil structure produces poor seedlings. Some grasses may grow well and be good for this soil. You could read up on this topic.