

Lapidary Level-II

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Module Title: - Handling and Storing Rough and Cut Gemstones

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LG #19	LO #1- Work with gemstone
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Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Documenting source, origin and types of rough gem stones
- Identifying appropriate storage conditions and locations
- Identifying rough and cut gem stones and prevent gems
- Grading gem stones
- Weighing and bagging gem stones

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, you will be able to –

- Document source, origin and types of rough gem stones
- Identify appropriate storage conditions and locations
- Identify rough and cut gem stones and prevent gems
- Grade gem stones
- Weigh and bag gem stones

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
3. Read the information written in the “Information Sheets”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-checks” which are placed following all information sheets.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-checks).

Information Sheet 1-Documenting source, origin and types of rough gem stones

1. Documentation

1.1.1. A Documentation:- is a written or printed paper that bears the original, official, or legal form of something and can be used to furnish decisive evidence or information. Or Something, such as a recording or a photograph, that can be used to furnish evidence or information.

1.1.2. The purpose of documentation is to: Describe the use, operation, maintenance, or design of software or hardware through the use of manuals, listings, diagrams, and other hard- or soft-copy written and graphic materials.

1.1.3. Type of rough gemstone



Figure 1. Type of rough gemstone



Figure 2. rough gem store by type

Type of opal

- composite natural opal – doublets, triplets, mosaic and chip opals
- natural opal type 1 – opal in one piece in its natural state apart from cutting and polishing
- natural opal type 2 – opal naturally attached to the host rock – boulder opal
- natural opal type 3 – opal intimately diffused as infilling in pores or between the grains of the host rock; matrix opal
- varieties of opal:
- (N1 to N9 represents gradation from black to white in approximately 10% intervals)
- Some example of inorganic gemstone:- Emerald, Sapphire, Rubby, Aquamarine, Amazonite, Tanzanite, etc.
- black – opal which shows a play of colour within or on a black or very dark body tone (N1, N2, N3, N4)

- dark – opal which shows a play of colour within or on a dark body tone (N5, N6)
- light – opal which shows a play of colour within or on a light body tone (N7, N8, N9).



Figure 3 Type of opal

The above mentioned gemstone type is collected different source or origin to gem cutter or polisher. Therefore the gem cutter or polisher record and documented by the following format.

Table 1. Gemstone recording format

No	Id No	Storage Id	Gemstone Type	Color	Quantity	Country of origin	Weight	Remark

Self-check 1	Written test
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Directions: Answer all the questions listed below. Examples may be necessary to aid some explanations/answers.

Instruction 1: choose the correct answer and write the letter on the space provided?

1. What is documentation means? (2 points)
2. Briefly discussed the purpose of documentation.
3. Prepare recording format for recording rough gemstone.

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Score = _____

Rating: _____

Information Sheet 2-Identifying appropriate storage conditions and locations

2.1. Introduction

Gemstone collection deserves to be organized and secure. You'll not only find the pieces you're looking for faster but also protect them from damage. That pile of precious stones may look opulent, but remember that gems have different hardness factors and can scratch each other over time. Some gemstones are also sensitive to environmental conditions or chip easily and shouldn't be left casually exposed.



Figure 4. Gemstone collection

2.2. Storage and Display Cases

There are many kinds of gemstone storage cases available



A. Gem storage with drawers

B. Small gemstone jars with foam inserts



C. A lightweight plastic container with dividers to store gemstones.



D. A parcel paper organizer holds parcel papers with gemstones for easy storage



E. Safe deposit box

If you have a sizeable gemstone collection or plan to have one, or want to keep detailed data on all your acquisitions, you should consider using an application like Excel or Google Sheets to organize that data on a spreadsheet. Not only can you store a vast amount of information that you can easily search, sort, and update, you can even use it to help you locate a specific piece in your collection, if you take the following steps:

Assign a unique ID number to each individually stored gemstone or lot of loose gemstones in your collection.

Assign a storage ID to every “spot” in your storage space. For example, if you have three storage cases, label them “A,” “B,” and “C.” If each case has five drawers, label each drawer

“1,” “2,” “3,” “4,” and “5.” (You can even label each compartment or jar in the drawer if you wish, “a,” “b,” “c,” “d,” etc). You can then record on your spreadsheet where each piece is located. For example, “A5” or “B1,” or “C2a.” You can consult your spreadsheet and find out which case, drawer, and compartment to open to find a particular stone. (If you add more cases or additional containers to a drawer, you can easily create additional storage IDs. A new case becomes “D.” A new jar in a drawer that already has four jars becomes “e,” etc.).

Refer Table 1 in the above information sheet 1.

Self-Check – 2	Written test
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Part 1:Short Answer Question

Instruction1- Describe the following question

1. List at least four type of appropriate storage of gemstone material(2 pt)
2. Why is separate storage needed four different type of gemstone(2 pt)

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

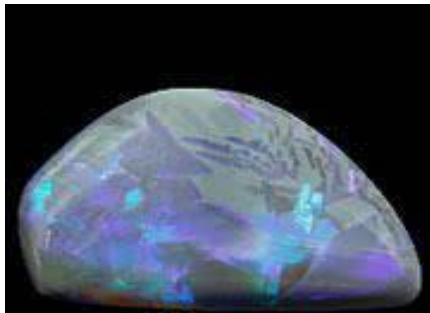
Score = _____
Rating: _____

Information Sheet 3-Identifying damage cause of rough and cut gem stones and taking preventive measure

3.1. Cause of damaging rough and cut gemstone

3.1.1. Dehydration

Dehydration in gemstone mean water is removed from crystalline. Example Opal is amorphous (i.e. noncrystalline), hydrated silicon dioxide ($\text{SiO}_2 \cdot n\text{H}_2\text{O}$), that contains about 3-15% H_2O by weight. If opal dehydrate it loses play of color



A. Unhydrated Opal



B. Dehydrated Opal formation

3.1.2. Exposure to halogen light

Exposure to halogen light may cause gemstone Luminescence is spontaneous emission of light by a substance not resulting from heat; or "cold light". It is thus a form of cold-body radiation. It can be caused by chemical reactions, electrical energy, subatomic motions or stress on a crystal.

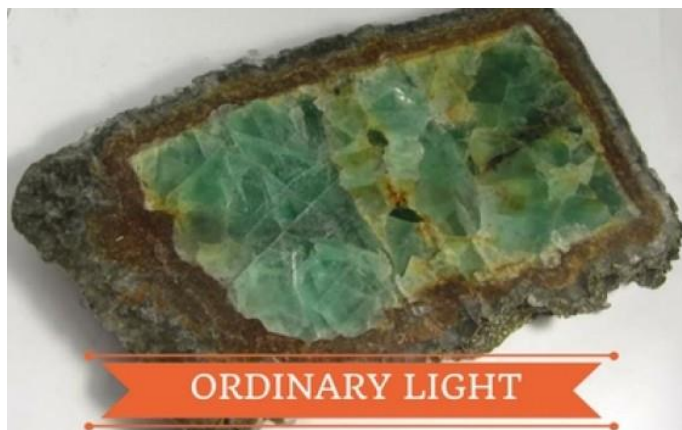


Figure 5. Gemstone luminescence

3.1.3. extremes of temperature

Heat-sensitive stones such as emerald, tsavorite, and tanzanite could be subject to damage if set in a style that requires soldering near stones already in place.

Some Other cause that genstone can damage is:-

- Surface damage and handling
- general wear and tear
- immersion in water
- rough handling

3.2. Preventive Mechanism

3.2.1. Dehydration preventive mechanism

- **Removing free water from Surface-reaching Porosity**

Initially the opal must be dried to remove free water from its open pores. Drying is conducted even very slowly, capillary forces and the surface tension of liquid in the pores and surface shrinkage relative to the deeper material lead to internal stress which eventually results in a grid of crazing cracks throughout the material.

The opal was immersed in anhydrous ethanol in a pressure-tight vessel and was slowly heated to 80°C and maintained at that temperature for about a week. It was presumed that most of the free water in its pores had then been replaced with ethanol by diffusion.

3.2.2. Protection from halogen light

First identify the types of gemstone that interact with uv light and makes gemstone luminance .

Other activity to prevent gemstone from damage

Use proper safety bags

Differentiate by hardness

Avoid any metallic wear when work with gemstone

Self-Check – 3

Written test

Part 1: Short Answer Question

Instruction 1- Describe the following question

1. What is the Cause of gemstone lumminance(1 pt)
2. What cause is happen in dehydration of gemstone(1 pt)
3. What mechanism is used to prevent dehydration of opal?(1pt)
4. List some tips that your gemstone is prevent from damage.(1pt)

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Score = _____

Rating: _____

Information Sheet 4- Grading gemstones

4.1. Grading criteria


The “Four Cs” of gem grading stand for color, clarity, cut, and carat (weight). Gemologists grade gemstones based on these properties. However, first you must understand that gemstones are graded by the rarity of their features.




There are a lot of steps to grade a gemstone. Each step of grading focuses on a different feature and has many details that create the overall grade determination. It can be difficult to understand gemstone grades without training, so with the help of the Fire Mountain Gems and Beads gemologists we've created a chart to help clarify the basics. Images of both emerald and lapis lazuli are shown to illustrate transparent and opaque versions of each grade.

There are other factors taken into consideration when grading colored gemstones

- The quality and rarity of the material,
- Enhancements,
- Overall size of the stone,
- Uniformity of shape,
- Quality of cutting/faceting
- The combination of graded features.

Table 2. Gemstone grading format

Grade	Hue and Color Saturation	Color Tone	Inclusions	Transparency/Opacity	Cutting, Surface, Drilling
A 	Color is the hue expected. Color saturation is vivid and even throughout the stone.	Color tone is rich, but not so dark as to be near the far end of the spectrum.	There are few, if any, inclusions. Any inclusions will be small and hard to spot with the naked eye.	Translucency/Opacity is as expected for the specific stone.	Cutting or shape is uniform. Surface has a smooth luster, high polish and no cracks or chips. The drilling of the hole is even and uniform.

 <p>B</p>	<p>Color is the hue expected, but may not be as vivid as an A grade. Saturation is fairly even throughout the stone.</p>	<p>Color tone is good, but may be lighter or darker than an A grade stone.</p>	<p>A few inclusions are seen, but they are small and unobtrusive.</p>	<p>The stone may not have the clarity or opacity of the same stone in an A grade.</p>	<p>Cutting or shape may exhibit some slight variances. Surface has a medium luster and moderate polish, cracks or chips are minimal and drilling is generally uniform.</p>
 <p>C</p>	<p>The color of the stone is within the hue expected, but may not be vivid or even.</p>	<p>Color tone is significantly lighter or darker--near the ends of the spectrum.</p>	<p>Inclusions or matrix mineral content is more apparent and frequent. These will be easily visible to the naked eye.</p>	<p>The stone may vary greatly in clarity/opacity from that expected.</p>	<p>Cutting or shape exhibits some variances. Surface has a medium to low luster and polish. Cracks or chips are more apparent. Drilling may lack uniformity.</p>
 <p>D</p>	<p>Color of the stone is generally the color expected, but saturation is low and very uneven.</p>	<p>Color tone can be so deep it seems black or so light it seems colorless.</p>	<p>Inclusions are frequent and greatly affect the overall look of the stone.</p>	<p>Stones expected to be transparent may be opaque or be heavily included. Stones expected to be opaque may have less original material and more "other" mineral content, causing more transparency.</p>	<p>Cutting or shape can be irregular. Surface has poor luster with cracks or chips. Drilling can be uneven.</p>

Introduction to colored stones grading (online webinar by Gem Color Academy experts)[via torchbrowser.com].mp4

Refer Mo 1 Lo 2. Apply the principle of grading gemstone

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Self-Check – 4

Written test

Part 1: Say true or false

1. Rarity is one of the criteria to grade Gemstone.
2. Colour is the most dominant factor in gemstone grading.
3. Gemstone can be classified Precious, semi precious and Ordinary
4. Gem grading is not necessary while storing the gem.
5. Carat in gemstone is used to measure the quality of gemstone.

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Score = _____

Rating: _____

Information Sheet 5- Weighing and bagging gemstones

5.1. Weighing and bagging

5.1.1. Weighing Gemstone

Traditionally, the weight of a gemstone is expressed in carats (1 carat = 0.20 grams or 200 milligrams). For gemstones weighing less than 1 carat, their weight is expressed in units that are 100 times smaller, known as points (e.g. 50 points = 0.5 carats).

One carat = . 2 grams or 200 milligrams, equal to 1/5 of a gram. Stones are measured to the nearest hundredth of a carat.



Figure 6 Weighing Scale of a gemstone

5.1.2. Bagging gemstone

Steps for bagging gemstone

1. Before store the gemstones, clean the gemstones. This is a critical first step. Gemstone care guide and gemstone jewelry care series of articles are great resources for properly cleaning and caring for your collection. You can invest in a state-of-the-art storage case and industry-standard parcel papers, but if your gemstones are dirty, oil and grime will slowly diminish their beauty and value even if they're tucked away securely.
2. sort collection.

Start by grouping like with like. Separate your gems into piles by species. Use a jeweler's tweezers to handle the gems to keep from soiling them again. You should also identify any individual stones that are particularly fragile and wrap them in jeweler's tissue paper.

You can choose to keep your gemstones sorted by species, or you can subdivide them into size, color, origin (country, state, or mine), etc., or any other gemological or personal criteria. Be sure when the time comes to place your gems in storage that you keep harder stones securely separated from softer stones.

Self-Check – 5	Written test
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Part 1: Say true or false

1. 1 carat of gemstone is equivalent to 1 gram.
2. When bagging gemstone we can put hard and soft gemstone in the same way.
3. Gemstone bagging and weighing is one of factors affecting gem quality.

Note: Satisfactory rating - 2 points

Unsatisfactory - below 2 points

Score = _____

Rating: _____

LG #20	LO #2- Use processes that minimise loss and theft
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Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- Identifying areas of risk
- Determining the strategy for minimizing risk
- Implementing risk minimization strategy
- Documenting facts and procedures about the gem stones

This guide will also assist you to attain the learning outcomes stated in the cover page. Specifically, upon completion of this learning guide, you will be able to:

- Identify areas of risk
- Determine the strategy for minimizing risk
- Implement risk minimization strategy
- Document facts and procedures about the gem stones

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
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Information Sheet 1-Identifying areas of risk

1.1. Introduction

Risk:-is the possibility of something bad happening. Risk involves uncertainty about the effects/implications of an activity with respect to something that humans value, often focusing on negative, undesirable consequences. Many different definitions have been proposed.

- **The most risk areas of gemstones are**

- ✓ Theft
- ✓ Chemicals
- ✓ Loses due to proper handling
- ✓ Temperature, and sunlight.

Some gems are sensitive for temperature and others for chemicals or sunlight. E.g. opal is sensitive sunlight and heat.



Figure 7. Risk scenario

Refer Mo1 Identify and asses gemstone and Lo2. Information sheet 1 Characteristics of gemstone.

Self-Check – 1

Written test

Name..... ID..... Date.....

Directions 1: Multiple Choice Items

Instruction 1: choose the correct answer and write the letter on the space provided?

1. During gemstone collection risk is arise from (1 points)
A. Heat B. Theft C. Temprature D. All
2. Risk Is uncertintity
A. True B. False
3. If the higher the risk the higher return is gain.
A. True B. False

Note: Satisfactory rating 2 points and above

Unsatisfactory - below 2 points

Answer sheet

Score = _____

Rating: _____

Information Sheet 2- Determining the strategy for minimizing risk

2.1. Steps of creating strategy

1. **Move from Issues to Choice** – Rather than focus on issues that can potentially trap strategists into building one strategy, strategists must understand the need to develop options for strategy. The approach also known as the “possibilities-based approach” begins with the recognition that organizations must make a choice to start the strategy-making process. Those choices will have consequences or potential risks, which have to be assessed among various levels of the organization in determining the right strategy.
2. **Generate Strategic Possibilities** – Once they recognize that a choice needs to be made, strategists should focus on the range of possibilities of strategies to consider. The range is based on three criteria
 - ✓ Desired output
 - ✓ The people
 - ✓ The rules
3. **Specify the Conditions for Success** – Once the possibilities have been created, they have to specify “what must be true” for each possibility to be the best choice. Often, the line between “what is true” and “what must be true” for each possibility gets blurred. Hence, it is important to keep this distinction in mind during this step. Doing so allows all conditions (potential risks) that have to be true for an attractive strategy to be identified.
4. **Identify the Barriers to Choice** – The possible conditions identified are assessed by deciding the condition that is believed to be the least likely to hold true. This condition would probably be the biggest barrier (or risks) to choosing that possibility. Besides the condition, they must pay close attention to the person who is the most skeptical since that person will represent the greatest obstacle. The barriers should then be ranked for the next step.
5. **Design Tests for the Barrier Conditions** – Here, the group must test each barrier condition to see if it holds true. One of the ways for testing is through surveys of 1000

customers or a single supplier. Also, it is recommended that the person who was most skeptical about a particular condition should lead the designing and testing of that condition. If that person is satisfied with the design, everyone else should be satisfied it because the skeptical person would employ high standards and thereby make the tests more effective.

6. **Conduct the Tests** – To be cost-effective, the condition that the group feels is least likely to hold up is tested first. If the group is right, then the possibility associated with that condition can be eliminated. At this stage, the group can employ the expertise of outside consultants and experts. By this step, the group has identified the possibilities and associated conditions (risks), and is testing those conditions.
7. **Make the Choice** – With careful consideration and exercising due diligence of the preceding six steps including the possibilities-based approach, the group makes the choice of the best possible strategy. This choice has been assessed, evaluated and tested to have the “fewest serious barriers.”



Figure 8 Risk management process

Self-Check – 2	Written test
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Name..... ID..... Date.....

Directions 1: short answer Items

Instruction 1:-Write the correct answer for the following questions?

1. List the risks of gemstones? (3points)
2. Identify risk minimization strategy steps.(4 pts)

Note: Satisfactory rating 3 points and above Unsatisfactory - below 3 points

Answer sheet

Test I

1. _____
2. _____
3. _____

Score = _____

Rating: _____

Information Sheet 3- Implementing risk minimization strategy

3.1. Risk implementation

The process of putting a strategic plan of managing identified threats and exploiting opportunities into action is called the implementation of the risk management plan.

Strategic implementation plan (SIP) is the document that you use to define implementation strategy. Typically it outlines the resources assumptions short and long term strategy.



Figure 10. Supply chain of risk management

Based on the risk determination and implementation plan risk of gemstone is avoided by the following ways

1. To theft
 - ✓ Use safe custodian
 - ✓ Put the gemstone in bank



Figure 11 Safe custodian of gemstone

2. Misplacement of gemstone material

Sort your gemstone by type color and size and orgion or country source and place the same gemstone in the right place.

3. Document the gemstone

No	Id No	Storage Id	Gemstone Type	Color	Quantity	Country of origin	Weight	Remark

Documenting procedure is one way of controlling gemstone inventory and loss due to theft

4. Environmental risk control

Heat and external atmosphere exposure resistant bagging is used to avoid loss due to heat and temperature.

Self-Check – 3	Written test
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Directions 1: short answer Items

Instruction 1:-Write the correct answer for the following questions?

1. List the risks implementation mechanisms of a avoid gemstone loss due to environmental exposure (3points)
2. Type of risk avoidance mechanism in gem theft (4 pts)

Note: Satisfactory rating 3 points and above Unsatisfactory - below 3 points

Answer sheet
Test I

Score = _____
Rating: _____

Information Sheet 4	Documenting facts and procedures about the gemstones
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4.1. Facts and procedure documentation

Documentation may include

1. Description

A description of the item that clearly describes the piece of jewelry in sufficient detail that someone reading that description can recognize the item.

2. Photograph

While not required, it makes it much easier to identify and replace the item once it no longer exists.

3. Value

The value conclusion should reflect the market. It should not be inflated, nor undervalued, as these would be detrimental to the client and could greatly affect premiums and settlements. The appraised value should be an amount that can adequately cover the jewelry should it be lost. Having a high value may make you feel good but generally will only increase your premiums while providing no additional coverage in a loss. It is not the dollar amount that protects your insured interest it is the thoroughness of the description that will be relied upon by an adjuster should a claim be made.

4. Sales taxes

are a consideration that should be discussed with both your insurance agent and your appraiser. It is important to know whether or not taxes are included in appraised value.

5. Treatment information

all treatments – that is any process done to improve the appearance of a the gemstone other than cutting and polishing–needs to be disclosed to the consumer.

Self-Check – 4	Written test
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Directions 1: short answer Items

Instruction 1:-Write the correct answer for the following questions?

1. What is documentation procedure in gemstone (3points)
2. What parameter includes in documenting gemstone (4 pts)

Note: Satisfactory rating 3 points and above Unsatisfactory - below 3 points

Answer sheet

Score = _____

Rating: _____

LG #21	LO #3- Controlling stock
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Instruction sheet

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- Identifying stock control system
- Following stock control procedures
- Maintain of stock recording

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to –

- Identify stock control system
- Follow stock control procedures
- Maintane of stock recording

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1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below.
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Information Sheet 1	Identifying stock control system
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1.1. Introduction

The fact or process of ensuring that appropriate amounts of stock are maintained by a business, so as to be able to meet customer demand without delay while keeping the costs associated with holding stock to a minimum.

A stock control system is also known as inventory management system in corporates all function as associated with inventory management and maintenance.

Inventory control systems are technology solutions that integrate all aspects of an organization's inventory tasks, including shipping, purchasing, receiving, warehouse storage (stock), and turnover, tracking, and reordering

Efficient stock control allows you to have the right amount of stock in the right place at the right time. It ensures that capital is not tied up unnecessarily, and protects production if problems arise with the supply chain. Any stock control system must enable you to:

1. Track stock levels.
2. Make orders.
3. Issue stock.

Table 3. Inventory control system recording

Company name and profile							
Id No	Name of gem	Catagory	Description			Total Value	Date of purpase
			Color	Carat	Cut		

Self-Check – 1

Written test

Directions 1: Short answer

Instruction 1: Discuss briefly the following question

-----1. What is inventory control system (5 points)

Note: Satisfactory rating 3 points and above

Unsatisfactory - below 3 points

Answer Sheet

Score = _____

Rating: _____

Information sheet 2:-Following stock control procedures

2.1. Stock control procedure

Stock control is a term for any and all procedures involved in monitoring and managing the amount of stock in the business at any given time. For almost all business all most use stock. Stock is the largest business investment in gemstone area.

Stock control procedure contains

- Determining Stock level policy
- Implement inventory control
- Cross checking inventory control

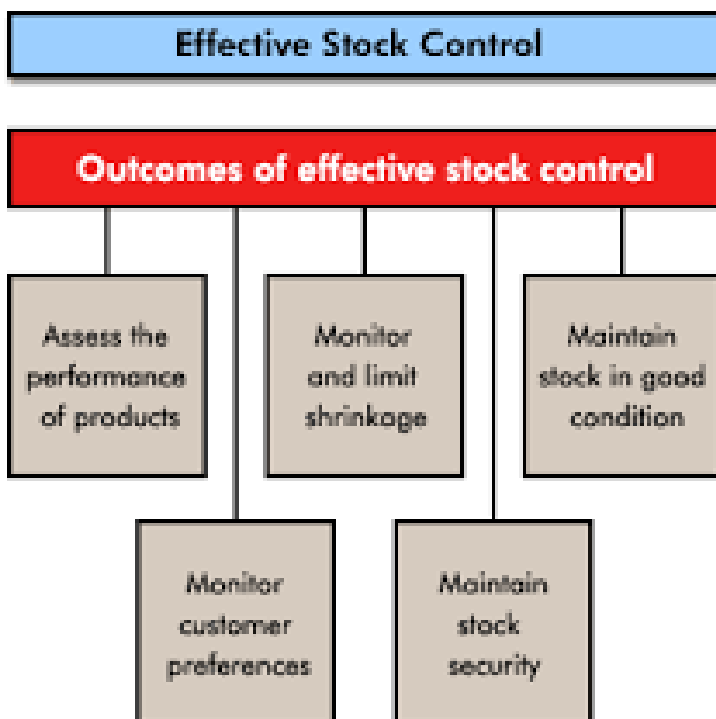


Fig 13. Effective stock control procedure

Self-Check -2

Written Test

Directions 1: Short answer

Instruction 1: Describe the following question

-----1. Discuss briefly the inventory control procedure(6pt)

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Answer sheet:-

1. _____

Score = _____

Rating: _____

Information sheet 3:- Maintaining of stock recording

3.1. Stock recording

The stock record displays the name of the real and beneficial owner, the number of shares, and the locations of all securities held by the firm. The stock record is updated every time a trade is executed.

Stock recording format contains

1. Stock requestion form
2. Stock recording cards
3. Storage of office supply
4. Recording on stock level
5. Use of software and electronic device

Self-Check – 3	Written test
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Directions 1: Short answer

Instruction:- Write the correct answers for the following questions on the space provided

1. What will included in sock recording format? (3 Point)
2. What is stock recording control?(1Pt)

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Score = _____

Rating: _____

Reference Book:

1. Gem& Gemology :THE QUARTERLY JOURNAL OF THE GEMOLOGICAL INSTITUTE OF AMERICA
2. JOEL E AREM, PHD, FG.A.Color encyclopidiya of gemstone. Second edition
3. Smithsonian; Nature guide of rocks and minerals
4. W.Dan Housen and Wayne M.Shulterd Gemstone and other unique minerals and rocks of WYOMING; A field guid to collector

WEB ADDRESSES

1. <https://www.gemsociety.org/article/cleavage-gemology/>
2. <https://www.gemsociety.org/article/handling-gems-securely/>
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