Principles of Design

Unit: The Art of Design

Problem Area: Elements and Principles of Design

Lesson: Principles of Design

Student Learning Objectives.

Instruction in this lesson should result in students achieving the following objectives:

1. **Explain how balance relates to design.**
2. **Relate proportion and scale to design.**
3. **Integrate rhythm into design.**
4. **Recognize emphasis in design.**
5. **Assess designs for harmony and unity.**

Resources.

The following resources may be useful in teaching this lesson:

"Introduction to the Principles of Design & Balance," *Utah Education Network*. Accessed Aug. 8, 2012. http://www.uen.org/Lessonplan/preview.cgi?LPid=14189.

Lewis, Evelyn L., and Carolyn S. Turner. *Housing and Interior Design*, 10th ed. Goodheart-Willcox, 2012.

"Principles of Design," *Utah Education Network*. Accessed Aug. 8, 2012. http://www.uen.org/Lessonplan/preview.cgi?LPid=9135.

Sherwood, Ruth F. *Homes & Interiors: Careers in Housing & Interior Design*. Glencoe/McGraw-Hill, 2007.

Wolfe, Mary. *Fashion Marketing & Merchandising*. 3rd ed. Goodheart-Willcox, 2009.

Equipment, Tools, Supplies, and Facilities

- ✓ Overhead or PowerPoint projector
- ✓ Visual(s) from accompanying master(s)
- ✓ Copies of sample test, lab sheet(s), and/or other items designed for duplication
- ✓ Materials listed on duplicated items
- ✓ Computers with printers and Internet access
- ✓ Classroom resource and reference materials

Key Terms.

The following terms are presented in this lesson (shown in bold italics):

- asymmetrical balance
- balance
- emphasis
- Fibonacci Sequence of Numbers
- formal balance
- golden mean
- golden ratio
- golden rectangle
- golden section
- gradation
- harmony
- informal balance
- opposition
- proportion
- radiation
- repetition
- rhythm
- scale
- symmetrical balance
- transition
- unity
- visual balance
- visual weight

Interest Approach.

Use an interest approach that will prepare the students for the lesson. Teachers often develop approaches for their unique class and student situations. A possible approach is included here.

> *For many students, the principles of design key terms may seem foreign. Knowing the basic interior design principles helps create cohesive spaces. Creating beautiful spaces requires a working knowledge of balance, proportion, scale, rhythm, emphasis, unity, and harmony.*

Project VM–A. Ask students to look at each interior and each fashion image. They should quickly decide if they like or dislike each image. Students should make a few notes about the parts of the designs they like and the parts they do not like. As you introduce the principles of design, inform the students that they will revisit these interior and fashion images.

CONTENT SUMMARY AND TEACHING STRATEGIES

Objective 1: Explain how balance relates to design.

Anticipated Problem: How does balance relate to design?

I. ***Balance*** is a basic design principle and refers to the way the designer uses design elements (e.g., line, shape, color, and texture) to create equilibrium among the objects or design parts. When balance exists, there is a sense of being equal in weight on both sides of a center point in a design. The type of balance used in a room helps determine the mood. For example, several small items on one side of a room, or on a part of a fashion design, can be balanced by one large object on the other side. ***Visual balance*** (visual weight) is similar in that it is affected by objects and the objects' value (lightness or darkness).

A. ***Formal balance*** is a situation in which identical, or nearly identical, items are arranged on either side of a center point. In some cases, formal balance may not be identical (mirror image), but it is similar enough (e.g., in terms of numbers of objects or color) to be considered formally balanced. ***Symmetrical balance*** (proportions: size, shape, and relative position) is another name for formal balance.

1. It is typical in designs considered formal or traditional.
2. Some people feel more comfortable with formal balance because it is more orderly and exudes a sense of calmness.

B. ***Informal balance*** is a situation in which objects are distributed unequally (asymmetrically) from the center point or centerline. The two sides of the center point are not exactly alike. However, one side does not overpower the other, so it still creates a feeling of balance. ***Asymmetrical balance*** (elements placed unevenly in the space) is a situation in which different but equivalent sizes, shapes, or weighted objects are arranged on either side of a center point. For the designer, informal balance is more difficult to achieve than formal balance.

1. The use of several small objects on one side and a larger object on the other side constitutes informal balance.

2. One dark object may be used to balance several light objects.
3. Informal balance creates a more casual atmosphere.

Teaching Strategy: *Assign the students to groups. Have them use design magazines or websites to find images that illustrate formal and informal balance.*

Objective 2: Relate proportion and scale to design.

Anticipated Problem: How do proportion and scale relate to design?

II. Proportion and scale

A. ***Proportion*** is the relative size and scale of design elements; it is the relationship between objects or parts of the whole. Another way to describe proportion is the ratio of one part to another part or one part to the whole. Leonardo da Vinci's "Vitruvian Man" is a world-renowned drawing often described as the Canon of Proportion. The drawing is a correlation of the ideal human form with geometry and is used as the principle source of proportion for architecture, interior design, fashion, artwork, sculpture, etc. Humans became "the measure of all things."

1. Bodies are a common way to measure. For instance, to demonstrate the proportion and scale of an item for sale online, a person's hand may hold a porcelain broach. Also, a person may be shown standing next to a chair to provide proportion and scale for an object that cannot be touched.
2. Greeks were masters of proportion and developed guidelines for proportion that are still used. People develop a sense of proportion based on visual perceptions.

B. ***Golden ratio*** is a unique number: 1.618033989. It is often known as the divine ratio, the golden mean, the golden number, and the golden section. The ***Fibonacci Sequence of Numbers*** are a unique sequence of integers, starting with 1, where each element is the sum of the two previous numbers. For example: 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, etc. The Fibonacci sequence is an infinite sequence. As it develops, the ratio of the consecutive terms converges (becomes closer) to the golden ratio: 1.618. For example, $1 \div 1 = 1$, $2 \div 1 = 2$, $3 \div 2 = 1.5$, $5 \div 3 = 1.66$, $8 \div 5 = 1.625$, and $21 \div 13 = 1.615$.

1. Nature—Flower petals are arranged in the Fibonacci sequence.
   a. Buttercups have five petals.
   b. Delphiniums have eight petals.
   c. Ragwort has 13 petals.
   d. Asters have 21 petals.
2. Architecture and furniture: A golden ratio is created when the United Nations Building's width is compared with the height every 10 floors.
   a. A ***golden rectangle*** is an object with sides, with a ratio of 2:3. The short side is ⅔ the length of the long side of the object.

b. A ***golden mean*** is the division of a line midway between ½ and ⅓ of its length. This uneven division is more pleasing to the eye and is often used in wall arrangements and when selecting the location of drape tiebacks.

c. A ***golden section*** is the division of a line in such a way that the ratio of the smaller item to the larger is the same as the larger item to the whole. Using this concept helps create more pleasing designs.

C. ***Scale*** is the relative size of an object in relation to other objects in the design. When a designer keeps items in scale to others in the space, the room is more visually pleasing. A smaller room requires a smaller scale of furniture. Another aspect of scale is visual weight.

1. ***Visual weight*** is the perception that an object weighs more or less than it actually does. Two chairs may have the same dimensions. However, if one is upholstered and the other is wooden, the upholstered chair has a greater visual weight.
2. Clarice T. Wilson did an excellent job of demonstrating scale and proportion in *Art Principles of Flower Arrangement*. She explains that scale and proportion have to do with pleasing size, but scale is the relationship of the different parts that make up the whole. In contrast, proportion has to do with the pleasing size relationships of areas or spaces that these different parts occupy.

Teaching Strategy: *Use VM–B through VM–F in a discussion. You may want to have students find additional pictures to demonstrate proportion and scale. You could also use some relevant videos from YouTube.*

Objective 3: Integrate rhythm into design.

Anticipated Problem: How can rhythm be integrated into design?

III. ***Rhythm*** is a device in design that suggests motion and works to lead the eye from one area or object to another; it creates visual interest. When an element of design forms an organized pattern, it forms rhythm. For example, a designer could create rhythm by using a color for the picture frame that is picked up by the painting, picked up again by pillow or decorative accents, and is repeated in the rug. Rhythm can be achieved through gradation, repetition, radiation, opposition, and transition.

A. ***Gradation*** (progression) is a type of rhythm created when a design element is gradually increased or decreased. A progression is achieved by lining up objects by size or color, moving from thin lines to thick lines, or moving from dark to light colors. Some designers create groupings of same-shaped boxes or figurines in various sizes to create graduation.

B. ***Repetition*** is a type of rhythm created with the recurrent use of objects, shapes, space, light, and/or color in a design. Repetition (e.g., a shape in a room or on a fabric design) establishes continuity. A room design can exhibit repetition by featuring round pillows, oval mirrors, circular windows, and perhaps an archway between two rooms.

C. ***Radiation*** is a type of rhythm in which the design is arranged in rays from a central point. When designers use radiation, lines radiate outward from a central point, such as those found in:

1. Sweeping curved staircases
2. Round pillows with a large button in the center creating pleats
3. A round sunflower petal mirror accent or decorative feature
4. The simple use of dining room furniture arranged in a circular grouping

D. ***Opposition*** is a type of rhythm created at the intersection of two right-angle lines, such as in the corner of a window or a picture frame. A home's construction creates opposition, such as where the corners of a room or where a horizontal line of furniture meets a vertical element (e.g., a column). Room accessories provide opposition rhythm, such as those lines found in plaid fabrics, the right angles of many fireplaces, and the placement of books on shelves.

E. ***Transition*** is a type of rhythm created with curved lines that carry your eyes from one area of the room to another. Examples of curved line transitions are arched windows, a drapery swag, a camel back sofa, and a spiral staircase.

Teaching Strategy: *Use VM–G to illustrate rhythm in design. You may want to assign the class to small groups and give them time to create a design based on the group's assigned rhythm type.*

Objective 4: Recognize emphasis in design.

Anticipated Problem: How do designers add emphasis in designs?

IV. ***Emphasis*** is a focal point or the center of interest in a design; it is an anchor for the design. The focal point draws attention to itself, such as a fireplace, a window wall, and an architectural feature. If a room has no architectural interest (e.g., a curved wall, fireplace, or ceiling to floor windows), the designer can create a focal point by grouping furniture pieces or by bringing an unusual or large piece into the room. Every well-designed room has a focal point to give the room stability (focus). A room with all elements of equal importance is boring or may feel "scattered."

A. The emphasis or focal point of the room should be worthy (substantial, eye-catching) of attention.

B. The emphasis or focal point of the room should dominate, not overpower, the design of the room.

C. The emphasis or focal point of the room should never be divided between two points. Competing focal points are unsettling and can cause confusion in the design.

Teaching Strategy: *Use VM–H. Have students work in groups to look through interior design magazines to find examples of focal points in various rooms.*

Objective 5: Assess designs for harmony and unity.

Anticipated Problem: How does a designer assess a design for harmony and unity?

V. Harmony and unity are the goal of any room design. Using all of the principles of design helps create rooms that people enjoy. One design idea or theme helps create unity and harmony. However, too much harmony and unity can be boring and can cause restlessness instead of restfulness.

A. ***Harmony*** is the unity among the elements or parts of the design to create one message; it provides a sense of restfulness to the inhabitant. When harmony is accomplished, there is usually one element of design that dominates the others. The other principles of design are used as "accents." One idea or theme is used and carried throughout the design. For example, one color (in various shades and tints) is repeated, one size or shape is repeated, or similar textures are used. Examples of themes are:

1. Prairie style (e.g., Frank Lloyd Wright)
2. Shaker
3. Art Deco
4. Country and French Country
5. Mid-Century Modern
6. Arts and Crafts
7. Industrial
8. Classic
9. French Provincial
10. Rococo
11. Baroque
12. Asian

B. ***Unity*** is proximity and a sense of order. When design elements are grouped close to one another, they are related. Elements that are farther apart are less related. Rooms that exhibit unity are viewed as a whole instead of as the individual elements it took to put it together.

Teaching Strategy: *Use VM–I. Revisit VM–A and VM–B. Have students retrieve the notes they took during the Interest Approach, and tell them to add any principles of design they now see in the images. Lead a class discussion of the students' perceptions of the principles of design. Assign LS–A.*

Review/Summary.

Use the student learning objectives to summarize the lesson. Have students explain the content associated with each objective. Student responses can be used in determining which objectives need to be reviewed or taught from a different angle. Questions at the ends of chapters in the textbook may be used in the Review/Summary.

Application.

Use the included visual master(s) and lab sheet(s) to apply the information presented in the lesson.

Evaluation.

Evaluation should focus on student achievement of the objectives for the lesson. Various techniques can be used, such as student performance on the application activities. A sample written test is provided.

Answers to Sample Test:

Part One: Matching

1. d
2. e
3. h
4. a
5. g
6. c
7. b
8. f

Part Two: Multiple Choice

1. a
2. d
3. b
4. a
5. c
6. c

Part Three: True/False

1. F
2. T
3. T
4. F
5. T
6. F

Sample Test

Name _____

Principles of Design

Part One: Matching

Instructions: **Match the term with the correct definition.**

a. emphasis
b. formal balance
c. golden mean
d. gradation
e. harmony
f. opposition
g. proportion
h. radiation

_____1. A type of rhythm created when a design element is gradually increased or decreased
_____2. The unity among the elements or parts of the design to create one message
_____3. A type of rhythm in which the design is arranged in rays from a central point
_____4. A focal point or center of interest
_____5. The relative size and scale of design elements; the relationship between objects or parts of the whole
_____6. The division of a line midway between ½ and ⅓ of its length
_____7. A situation in which identical, or nearly identical, items are arranged on either side of a center point
_____8. A type of rhythm created at the intersection of two right-angle lines

Part Two: Multiple Choice

Instructions: **Circle the letter of the correct answer.**

1. _____ is not a principle of design.
   a. Form
   b. Proportion and scale
   c. Rhythm
   d. Harmony
2. Transition rhythm is created with _____ that carry your eyes from one area of the room to another.
   a. lighting features
   b. columns
   c. right angles
   d. curved lines

3. Lines that meet at right angles are _____ rhythm.

   a. gradation
   b. opposition
   c. radiation
   d. repetition

4. The use of several small objects on one side and a larger object on the other side constitutes an example of _____.

   a. informal balance
   b. unity
   c. golden ratio
   d. symmetrical balance

5. In a small room, furnishings should appear _____ in visual weight.

   a. heavy
   b. mixed
   c. light
   d. All of the above

6. Proximity and a sense of order is _____.

   a. visual weight
   b. Fibonacci Sequence of Numbers
   c. unity
   d. asymmetrical balance

Part Three: True/False

Instructions: **Write *T* for true or *F* for false.**

_____1. The golden triangle has sides in a ratio of 2:3.

_____2. The Greeks developed guidelines for the use of proportion.

_____3. Visual weight can be achieved by using light, color, and/or texture.

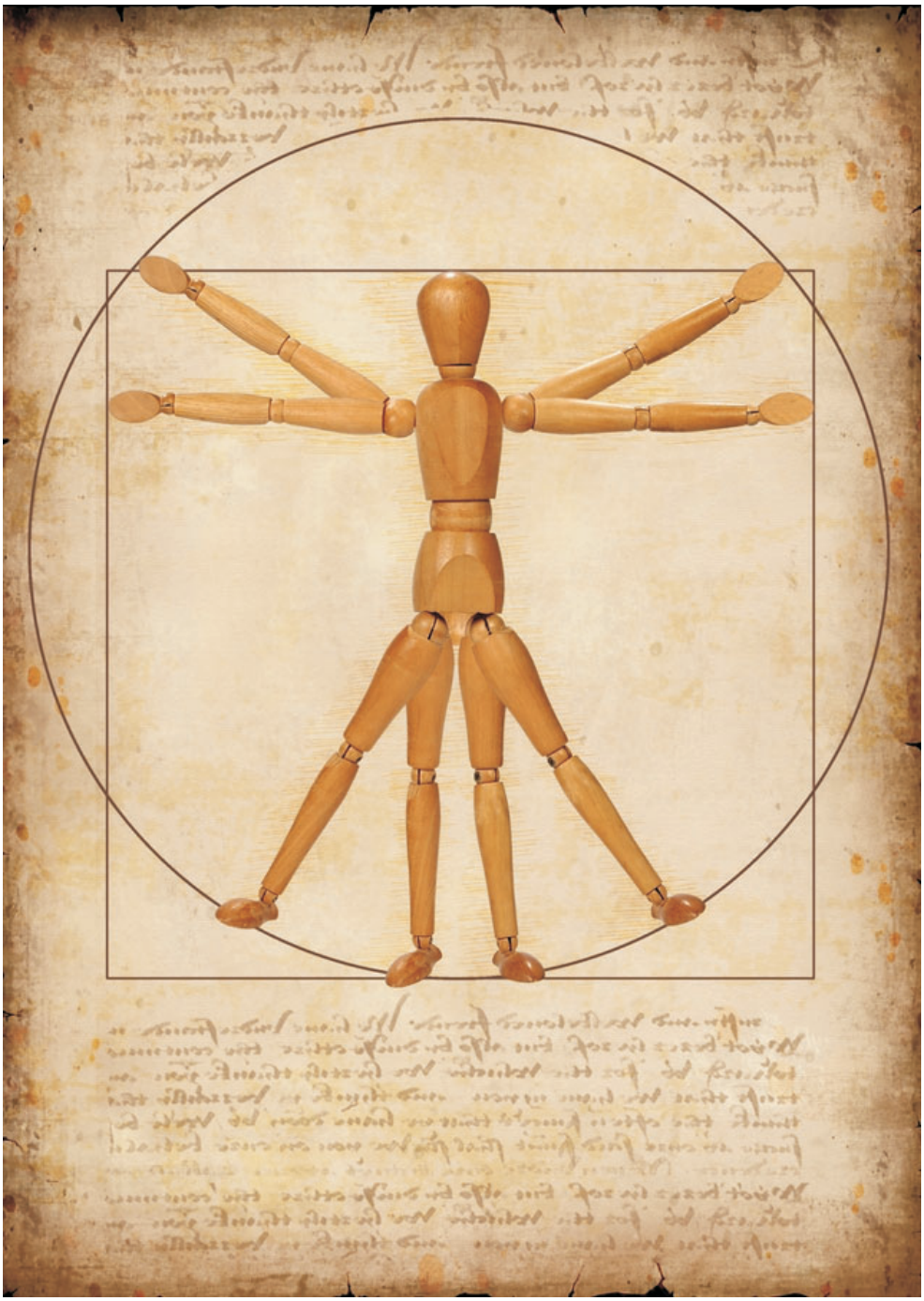
_____4. Architectural features are always the focal point of a room.

_____5. Another name for formal balance is symmetrical balance.

_____6. Gradation is lines flowing outward from a central point.

INTERIORS AND FASHION

PROPORTION: DA VINCI'S VITRUVIAN MAN



Vitruvian Man depicts a male figure in two superimposed positions with his arms and legs apart and simultaneously inside a circle and square and became the way we measure proportion and scale. Try of these proportional measurements as described by DaVinci. Remember, DaVinci based his proportion on a male figure; women's proportions are slightly different.

- A palm is the width of four fingers.
- A foot is the width of four palms (about 12 inches).
- The length of a man's outstretched arms (arm span) is equal to his height.
- The distance from a man's hairline to the bottom of the chin is one-tenth of his height.
- The maximum width of the shoulders is a quarter of a man's height.
- The distance from the elbow to the armpit is one-eighth of a man's height.
- The length of the hand is one-tenth of a man's height.
- The length of the ear is one-third of the length of the face.
- The length of the foot is one-sixth of a man's height.

GOLDEN RECTANGLE

This dressing table with mirror has a ⅔ ratio: the short sides are ⅔ the length of the longer side.

GOLDEN MEAN

The nautilus is an example of the Fibonacci spiral pattern in nature.

SCALE

In the book, *Alice in Wonderland*, Alice eats some mushrooms and grows "out of scale" with the room. Scale is the relative size of an object in relation to other objects.

VISUAL WEIGHT

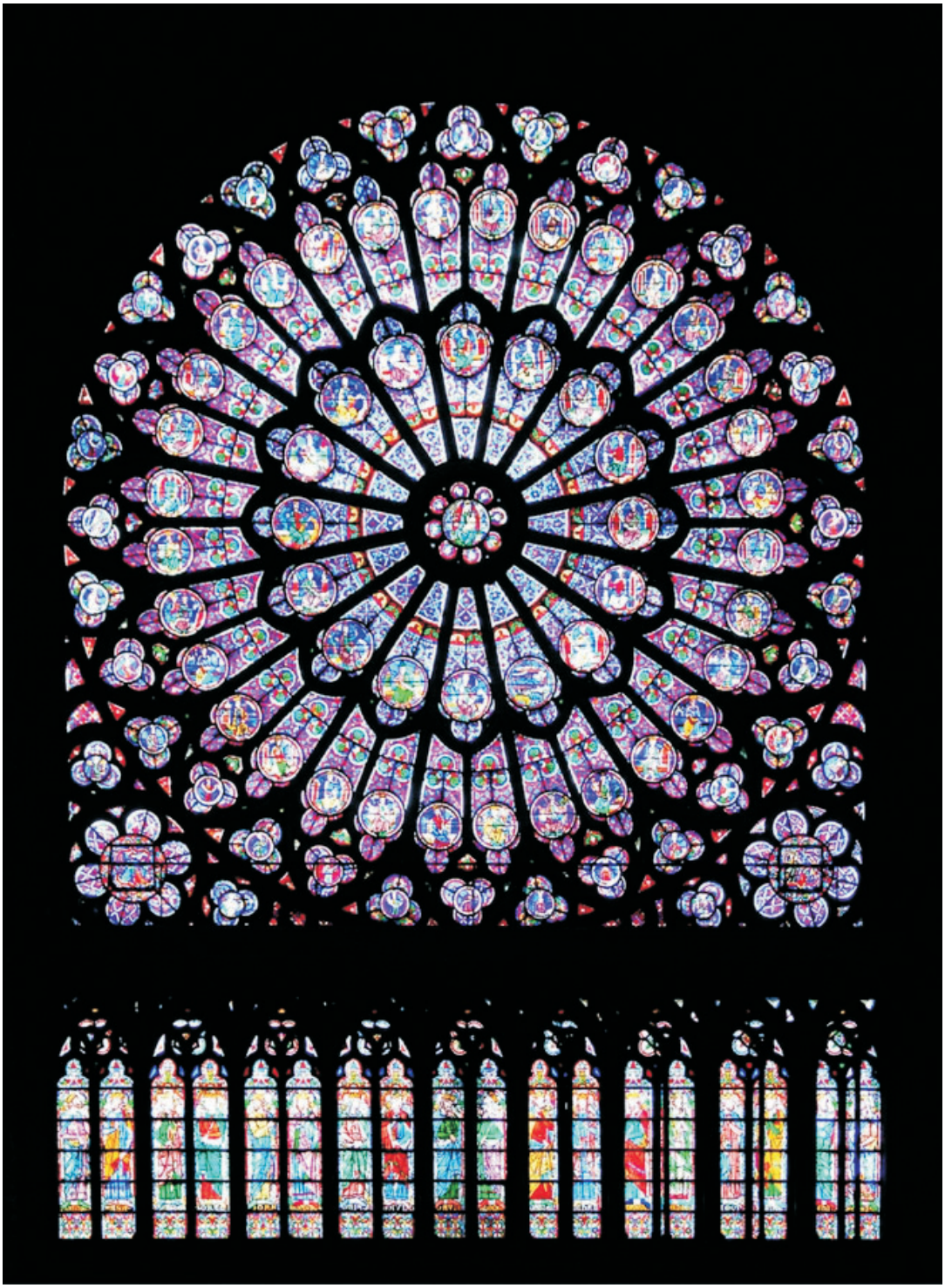
Visual weight is the perception that an object weighs more or less than it really does. Which chair has the most visual weight? What explains that perception?

RHYTHM: GRADATION, REPETITION, RADIATION, OPPOSITION, AND TRANSITION

Gradual color change in this child's bedroom is an example of gradation rhythm: from red, to raspberry, to bubblegum, to softer tints of pink.

Using identical picture frame size and wall placement is a good example of repetition rhythm. Notice that the bedspread and side table box also use green.

This stained glass rose window at Notre Dame Cathedral in Paris, France is an excellent example of radiation rhythm—lines flow outward from the center point.



This living room and bedroom apartment has many points of opposition—right angles. How many do you count?

Curved lines produce transition rhythm. Notice how the curved lines of the couch and ceiling details cause your eye to move about the room.

EMPHASIS

The fireplace is the focal point in this particular room.

HARMONY AND UNITY

Harmony and unity are present when all parts of the design are related by one idea or theme.

Name _____

A Design Folio

Purpose

The purpose of this activity is to reinforce your understanding of design principles.

Objectives

1. Review the principles of design.
2. Find examples of each of the principles of design.
3. Create a design folio of the examples you selected.

Materials

- old magazines
- colored paper
- scissors
- glue or glue sticks
- fine markers
- three-hole punch
- yarn or ribbon for binding

Procedure

1. Work independently to complete this design folio.
2. Cut room pictures, or parts of room pictures, from old magazines that illustrate each of the principles of design listed below.
3. Neatly mount the pictures on your colored paper, leaving space to label and define each principle in your own words (approximately two sentences each). Be creative about the picture placement, label, and definition style.
   a. Formal balance
   b. Informal balance

c. Proportion
d. Scale
e. Golden rectangle
f. Visual weight
g. Rhythm—graduation
h. Rhythm—repetition
i. Rhythm—radiation
j. Rhythm—opposition
k. Rhythm—transition
l. Emphasis

4. Next, select four overall room themes (e.g., Arts and Crafts, Art Deco, and Asian) that represent harmony and unity of room design. List your four selections below. Then find examples of each theme to mount, label, and describe for your folio.

   a.

   b.

   c.

   d.

5. Bind your folio for presentation. In small groups, share your folios. Discuss your favorite room designs.
6. Participate in a class discussion and a walk-about to view the design folios.
7. Select one folio page to post as your favorite room.
8. Turn in your completed folio to your instructor.