

GRADES FOUR TO SIX

LEARNING FROM PAINTINGS 1



Figure 14:
*Khosrow Killing the Lion
Outside Shirin's Tent*
Folio from a dispersed *Khamseh*
(*Quintet*) of Nezami (d. 1209)
Tabriz, Iran, ca. 1525
Opaque watercolour, ink, gold,
and silver on paper
25.4 x 21.2 cm
AKM93

The arresting painting in Figure 14 illustrates a pivotal scene from the romance of Khosrow and Shirin, one of the five poems that comprise the *Khamseh* of Nezami Ganjavi (d. 1209). Khosrow, a prince and hero, strikes the lion with his bare hands, killing it to protect his adored Shirin, an Armenian princess. The artist has provided a wealth of detail to capture the attention: Khosrow is dressed in his nightclothes to underscore the urgency of his mission, and Shirin shows her surprise by biting her finger.

Shirin's spectacular tent, however, dominates the scene. The dome is of particular interest since it uses a fanciful decoration of human heads, leopards, cheetahs, and a monkey framed with a spiralling pattern of vines and leaves.

Did You Know?

The domed tent in Figure 14 features a version of the fabled *waqwaq* tree that was believed to grow at the edges of the earth and bears human and animal heads as fruit. The painting in Figure 15 is an illustration of another episode in the *Khamseh* poems, when Alexander the Great learns of his own death from a *waqwaq* tree. The tree symbolizes how far Alexander travelled.



Figure 15:
Alexander's Ship Arrives at the Waqwaq Tree
Painting depicting Alexander the Great's far travels
Qazvin, Iran, ca. 1590
Opaque watercolour, ink, and gold on paper
44.2 x 31.2 cm
AKM219



CURRICULUM EXPECTATIONS AND KEY UNDERSTANDINGS

VISUAL ART

OME Expectation	Key Understanding
Develop an understanding of the elements of design. Learn to use them in creative work.	Developing Creativity, Communicating: Works of art communicate thoughts, feelings, and ideas, and an understanding of the elements and principles of design supports both the creation and analysis of works of art.
Develop an understanding of the principles of design, with a focus on emphasis (Grade 4), proportion (Grade 5), and balance (Grade 6). Learn to use them in creative work.	Developing Creativity, Communicating: The principles of design are strategies to create works of art. Giving attention to the principles of design allows the artist to create, communicate, and represent ideas and feelings in interesting ways.
Understand the principle of perspective as it relates to the element of space and as a principle of design: diminishing perspective (Grade 4), atmospheric perspective (Grade 5), and one-point perspective (Grade 6).	Developing Creativity, Communicating: There are different ways to portray depth and focus in paintings. Muslim artists in the past have portrayed perspective differently in Persian and Moghul painting than artists in Europe have done in landscape painting.

LANGUAGE

OME Expectation	Key Understanding
Media Literacy: Demonstrate an understanding of a variety of media texts (all grades).	A painting represents one or several points of view about what is portrayed.

LEARNING THROUGH INQUIRY AND LEARNING BY DOING: PROMPTS AND ACTIVITIES

Visual Art

- **Creating and Presenting:** Using a 4 x 4 cm viewfinder, find your favourite segment of the painting in Figure 15. Then make your own painting of that segment sized 15 x 15 cm. Put the class's or group's paintings together on a wall and discuss your piece, and what you noticed about the original. Using the terminology of foreground, middle ground, and background describe what is going on in each area of the composition.
- **Cultural Contexts:** How do you think the actions of the people in the painting in Figure 15 convey their ways of life? What information is communicated through this depiction? What questions do you have? (Invite and record "I wonder" questions. "I wonder ...") How would you change the actions of people to convey different information?
- **Reflecting, Responding, and Analyzing:** How did the artist use the principle of balance in this painting?

Language

- Describe the story in your own words and explain how the artist has incorporated landscape, architecture, and human and animal drama into the work.



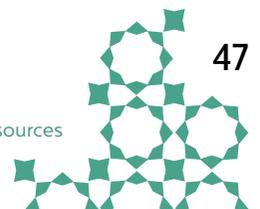
LEARNING FROM PAINTINGS 2



Figure 16:
Rostam Shooting the Turanian Hero Ashkabus
 Folio from a dispersed *Shah-Nameh*
 (Book of Kings) produced for
 Sultan 'Ali Mirza Lahijan, Iran, 1494
 Opaque watercolour, ink, and gold on paper
 23.3 x 15.2 cm
 AKM92

The cascade of arrows hurtling back and forth between the two warring parties in Figure 16 is symbolic of one of the recurring themes of the *Shah-Nameh*: the war between the Iranians and the Turanians, their Central Asian opponents.

Advancing from the right is an Iranian army led by the mythical warrior Rostam on his loyal blue-armoured horse, Rakhsh. As always, Rostam is identified by his tiger-skin clothes and by his prominent position in the painting. Not only is he larger in size than all the other characters, but he alone has the courage to lead them into battle on the open field. Rostam's valour and forward movement are contrasted on the left by the reticence of the Turanian army and the fall of their leader, Ashkabus, pierced by Rostam's flying arrow. By raising the horizon line to the top of the painting, the artist managed to create a large battle scene in the confined space of the paper.



Did You Know?

Rostam the hero is always identified by the tiger-skin tunic he wears. Rostam's horse, Rakhsh, was as much a character in the *Shah-Nameh* as his master. The painting in Figure 17 shows one of his exploits in which he kills a lion near the sleeping Rostam.

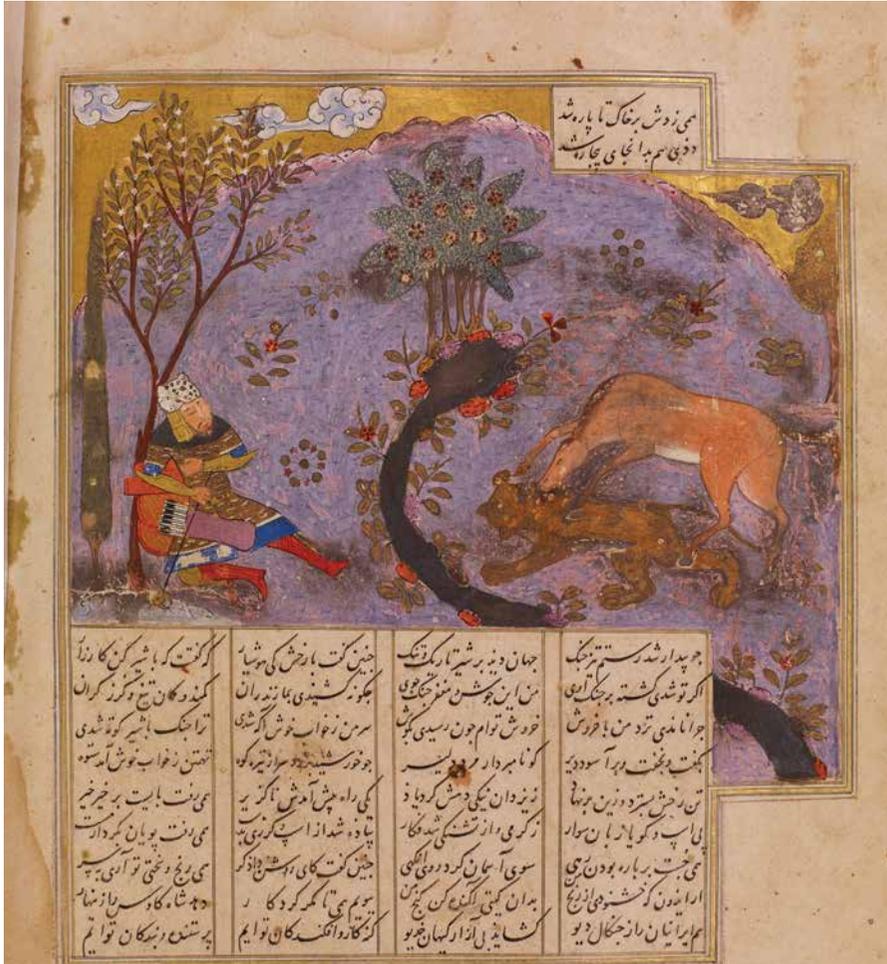


Figure 17:
Rakhsh Fights the Lion While Rostam Sleeps
 Folio 69v from a *Shah-Nameh* (Book of Kings) by Ferdowsi (d. 1020)
 Shiraz, Iran, 1457
 Opaque watercolour, ink, and gold on paper
 33.8 x 24.6 cm
 AKM268

CURRICULUM EXPECTATIONS AND KEY UNDERSTANDINGS

VISUAL ART

OME Expectation	Key Understanding
<p>Develop an understanding of the elements of design. Learn to use them in creative work.</p> <p>Develop an understanding of the principles of design, with a focus on emphasis (Grade 4), proportion (Grade 5), and balance (Grade 6). Learn to use them in creative work.</p>	<p>Developing Creativity, Communicating: Works of art communicate thoughts, feelings, and ideas, and an understanding of the elements and principles of design supports both the creation and analysis of works of art.</p>
<p>Understand the principle of perspective as it relates to the element of space, and as a principle of design: diminishing perspective (Grade 4), atmospheric perspective (Grade 5), and one-point perspective (Grade 6).</p>	<p>Developing Creativity, Communicating: There are different ways to portray depth and focus in paintings. Muslim artists in the past have portrayed perspective differently in Persian and Moghul painting than artists in Europe have done in landscape painting.</p>

LANGUAGE

OME Expectation	Key Understanding
<p>Media Literacy: Demonstrate an understanding of a variety of media texts (all grades).</p>	<p>A painting can represent multiple points of view and can be interpreted in different ways.</p>

SUPPORTING ENGLISH LANGUAGE LEARNERS

OME Expectation	Key Understanding
Oral Communication: Communicate orally about what you see using short words and phrases.	A painting can be described effectively using words, phrases, and sentences.
Writing: Organize information by copying words or using ready-printed word cards into a point-form report on a painting.	A statement in writing can describe what is happening in a painting.

LEARNING THROUGH INQUIRY AND LEARNING BY DOING: PROMPTS AND ACTIVITIES

Language

- Reading and Media Literacy: What do you learn about the painting in Figure 16 from reading the label? What do you still want to know about it?
- How is the warfare in Figure 16 different from the way battles are fought today?
- Writing: Research an object in an Aga Khan Museum exhibition or online database and write a letter to the artist or maker expressing a particular point of view. For example, for the painting in Figure 16, respond to how the scene depicted makes you feel. Pick two adjectives from the following list or from your own imagination and use them in your letter: (excited, frightened, bored, uncomfortable, itchy, admiring, sleepy, happy, unhappy).

Supporting English Language Learners

- Writing: Complete this cloze activity focusing on nouns for Figure 16:
The great hero Rostam rode his ____ into the battle. Many ____ flew back and forth between the soldiers. One soldier blew a ____ shaped like a _____. Some soldiers flying a red ____ watched the ____ from above. Rostam shot an ____ into the ____ of Ashkabus and he fell forward from his ____.



LEARNING FROM PAINTINGS 3

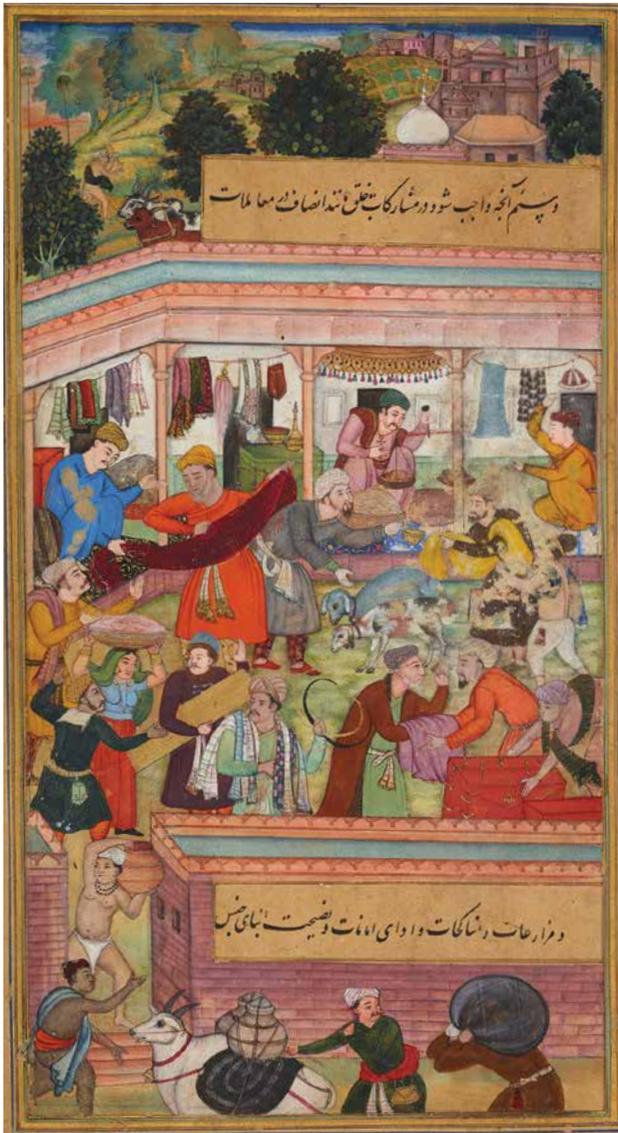


Figure 18:
A Market Square
Folio 80r from the *Akhlaq-e Nasiri*
(Ethics of Nasir) by Tusi (d. 1274)
Northern India, 1590–95
Opaque watercolour, ink, and gold on paper
23.9 x 14.2 cm
AKM288

The colourful painting in Figure 18 comes from a treatise on ethics, social justice, and politics by a medieval Iranian philosopher, Nasir al-Din Tusi (d. 1274), who lived in Iran and studied among the great scholars and mystics of the period. More than 300 years later, the *Akhlaq-e Nasiri* was a favourite book of Akbar the Great, the third Moghul emperor of India. It was in one of Akbar's courtly workshops that the manuscript containing this painting was copied and illustrated. The way the artists animated its philosophical ideas with stories makes this manuscript very remarkable.



For this painting, market activities illustrate fair dealing – such as giving a product a fair price – in transactions, which is the subject of the upper text panel. The lower text panel extends the rule of fair dealing to the sharing of possessions and the counselling of one’s fellow citizens.

Did You Know?

Markets in towns and cities bring people together for trade and exchange. Many different kinds of people are pictured living and working together, rich people, poor people, dark- and light-skinned people, shepherds, cloth sellers, and food sellers.

CURRICULUM EXPECTATIONS AND KEY UNDERSTANDINGS

SOCIAL STUDIES

OME Expectation	Key Understanding
Demonstrate an awareness of ways in which works of art express the ways of life of pre-modern societies (Grade 4).	Conditions and ways of life were very different in the past yet people acted (interacted and behaved) in ways we can recognize and relate to today.
Compare key aspects of life in medieval societies with present-day Canadian society (Grade 4).	By studying the past, we can better understand the present.
Use the social studies process to investigate different perspectives on the historical and/or contemporary experience of two or more distinct communities in Canada (Grade 6).	Different groups may experience the same development or event in different ways.



VISUAL ART

OME Expectation	Key Understanding
<p>Develop an understanding of the elements of design. Learn to use them in creative work.</p> <p>Develop an understanding of the principles of design, with a focus on emphasis (Grade 4), proportion (Grade 5), and balance (Grade 6). Learn to use them in creative work.</p>	<p>Developing Creativity, Communicating: Works of art communicate thoughts, feelings, and ideas, and an understanding of the elements and principles of design supports both the creation and analysis of works of art.</p>
<p>Understand the principle of perspective as it relates to the element of space, and as a principle of design: diminishing perspective (Grade 4), atmospheric perspective (Grade 5), and one-point perspective (Grade 6).</p>	<p>Developing Creativity, Communicating: There are different ways to portray depth and focus in paintings. Muslim artists in the past have portrayed perspective differently in Persian and Moghul painting than artists in Europe have done in landscape painting.</p>

LANGUAGE

OME Expectation	Key Understanding
<p>Media Literacy: Demonstrate an understanding of a variety of media texts (all grades).</p>	<p>A painting represents one or several points of view about what is portrayed.</p>

LEARNING THROUGH INQUIRY AND LEARNING BY DOING: PROMPTS AND ACTIVITIES

Social Studies

- Heritage and Identity: (Grade 4): Use the scene in the painting in Figure 18 to research and write a report on the way people lived in the time and place of the work of art. What do you think is different from today? What do you think is similar? (For help with resources, check the Further Reading section at the end of this *Guide*.)



- Think about a marketplace in your neighbourhood. This place could be in the downtown core or in a suburban shopping mall. Compare this setting to the painting in Figure 18. Are there any similarities? Use the Venn diagram in Figure 19 as a sample to record your observations. Three categories are added, but you can add many more as you observe. Put differences in the outer circles and similarities in the space where the circles overlap. This can be an individual or group activity.

Marketplace in Nasir's Ethics

Marketplace Today

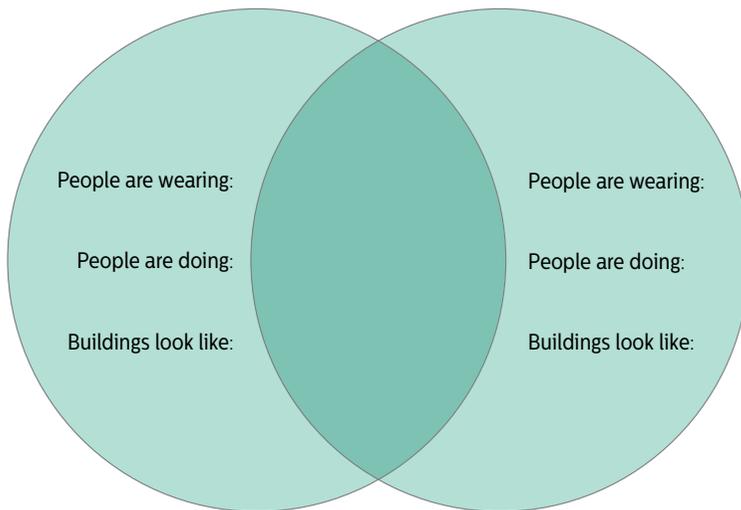


Figure 19:
Venn Diagram
for Marketplace Comparison

Language

- Describe the story in your own words and explain how the artist has incorporated landscape, architecture, and human and animal drama into the work.



LEARNING FROM PAINTINGS 4



Figure 20: A Blood-Measuring Device
Kitab al-Hiyal al-nafi'ah
(The Book of Knowledge
of Ingenious Mechanical Devices)
Al-Jazari (d. 1206)
Cairo, Egypt, 1354
Opaque watercolour, ink, gold,
and silver on paper
27.3 x 39.1 cm
AKM11

The painting in Figure 20 comes from a popular treatise on mechanical devices and automata that was written in 1206 and copied continuously in the following centuries. Al-Jazari, the author of *Kitab al-Hiyal al-nafi'ah* (The Book of Knowledge of Ingenious Mechanical Devices), included descriptions of more than 100 devices in his treatise, one of which is can be seen here. This fascinating device builds on two scientific ideas: bloodletting as a medical treatment, and the use of simple machines to create complex automata. The treatment of various ailments through bloodletting was common until the 19th century, and it clearly did not require such a complex device.



Did You Know?

The patient puts a cut finger into a hole in the basin; blood falls through channels into a lower chamber and displaces a float. The float is attached to one end of a rod that, on its other end, attaches to the pen in the hand of the scribe on the upper left. As the level of the blood in the basin rises, it pushes the float up, moving the scribe's pen and indicating marks on his writing board. A string fixed to the rod controls the action of the other two figures. It loops over the large pulley and then around a vertical pulley, and its other end holds a weight. The large pulley's rotation makes the hands of the central figure alternate to indicate the drams collected in units of ten. The vertical pulley controls the scribe on the right, which rotates to point to the upright markers, indicating the individual drams.

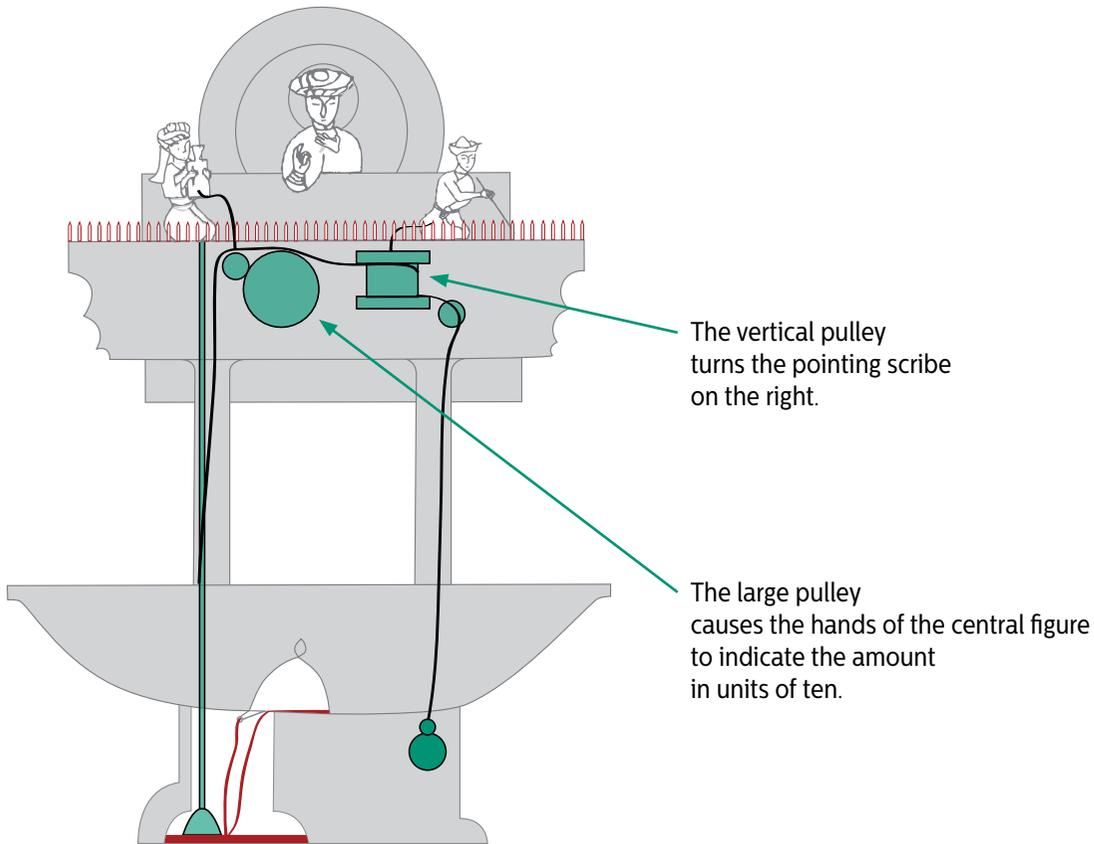


Figure 21:
A diagram showing the mechanism
of the device.



CURRICULUM EXPECTATIONS AND KEY UNDERSTANDINGS

SCIENCE AND TECHNOLOGY

OME Expectation	Key Understanding
Pulleys and Gears (Grade 4): Understand the basic principles and functions of pulley systems and gear systems.	Pulleys and gears change the speed, direction, and motion of, and force exerted on moving objects.

VISUAL ART

OME Expectation	Key Understanding
Develop an understanding of the elements of design. Learn to use them in creative work. Develop an understanding of the principles of design, with a focus on emphasis (Grade 4), proportion (Grade 5), and balance (Grade 6). Learn to use them in creative work.	Developing Creativity, Communicating: Works of art communicate thoughts, feelings, and ideas, and an understanding of the elements and principles of design supports both the creation and analysis of works of art.

SOCIAL STUDIES

OME Expectation	Key Understanding
Demonstrate an awareness of ways in which works of art express the ways of life of pre-modern societies (Grade 4).	Conditions and ways of life were very different in the past yet people acted in ways we can recognize today.
Compare key aspects of life in medieval societies and compare them to present-day Canadian society (Grade 4).	By studying the past, we can better understand the present.
Use the social studies process to investigate different perspectives on the historical and/or contemporary experience of two or more distinct communities in Canada (Grade 6).	Different groups may experience the same development or event in different ways.

LEARNING THROUGH INQUIRY AND LEARNING BY DOING: PROMPTS AND ACTIVITIES

Science, Technology, Engineering, Mathematics (STEM)

- Pulleys and Gears (Grade 4): Forces Acting on Structures and Mechanisms (Grade 5): How do you think the pulley system works in the machine depicted in the painting in Figure 20? Explain the external forces causing it to work.
- Construct a simple pulley using an empty ribbon spool and some cord, or other materials you can find at home or in the classroom.

Visual Art

- Look closely at a gadget in your home or classroom, e.g. a pencil sharpener or egg beater, and draw it, looking carefully at the mechanism and trying to show how it works.



LEARNING FROM PAINTINGS 5



Figure 22:
Qur'an
Copied by Mahmud Sha'ban
Gwalior Fort, India, 1399
Ink, opaque watercolour,
and gold on paper
Folio: 28.9 x 22.2 cm
AKM281

Copied under the Tughluqs (1320–1414) who ruled parts of present-day India and Pakistan before the Moghuls, the unique Qur'an in Figure 22 is one of the earliest surviving manuscripts in the *bihari* script. Known as the Gwalior Qur'an after the Gwalior Fort where it was copied, this Qur'an testifies to the active diplomatic networks and cultural and economic interactions in the 14th and 15th centuries. Although the *bihari* script, which was common in pre-Moghul India, is a unique variation on *naskh*, the decorative features of the Gwalior Qur'an bring together elements from Mamluk (1250–1517) and Ilkhanid (1256–1353) layout and illuminations, as well as the exuberance of Indian painting conventions.



The multicoloured design of this spectacular opening folio is a version of the geometric star-and-polygon pattern that may have originated as early as the 9th century in Iraq. It has been employed ever since in countless variations in architecture, manuscript embellishment, and decoration of objects.

Did You Know?

Muslims believe that the Qur'an is the Word of God revealed to the Prophet Muhammad in the 7th century CE. The central message of the Qur'an is for humanity to believe in and worship God, and to live a pious and ethical life. The Qur'an, the Muslim Holy Book, also contains histories, parables, and stories that have inspired artists, writers, thinkers, and scientists.

CURRICULUM EXPECTATIONS AND KEY UNDERSTANDINGS

MATHEMATICS

OME Expectation	Key Understanding
Geometry and Spatial Sense: Identify and classify the symmetry operations of reflection (Grade 4), translation (Grade 5), and rotation (Grade 6).	Geometric objects have properties that allow them to be classified in a variety of ways.
Patterning and Algebra: Extend and create repeating two-dimensional patterns involving reflections (Grade 4), translations (Grade 5), and rotations (Grade 6).	The symmetry operations of reflection, translation, and rotation are the rules according to which patterns are constructed.

VISUAL ART

OME Expectation	Key Understanding
Develop an understanding of the elements of design. Learn to use them in creative work. Develop an understanding of the principles of design, with a focus on emphasis (Grade 4), proportion (Grade 5), and balance (Grade 6). Learn to use them in creative work.	Developing Creativity, Communicating: Works of art communicate thoughts, feelings, and ideas, and an understanding of the elements and principles of design supports both the creation and analysis of works of art.
Understand the principle of perspective as it relates to the element of space and as a principle of design: diminishing perspective (Grade 4), atmospheric perspective (Grade 5), and one-point perspective (Grade 6).	Developing Creativity, Communicating: There are different ways to portray depth and focus in paintings. Muslim artists in the past have portrayed perspective differently in Persian and Moghul painting than artists in Europe have done in landscape painting.



LEARNING THROUGH INQUIRY AND LEARNING BY DOING: PROMPTS AND ACTIVITIES

Cross-Curricular Connections

- Visual Art and Mathematics: What artistic principles of design do you think the artist used for the creation of the Qur'an folio in Figure 22? What geometry operations can you find in the design? Make a list of all that you can find. Then create your own design on paper with a compass or on a computer, following the guide in Figure 23.

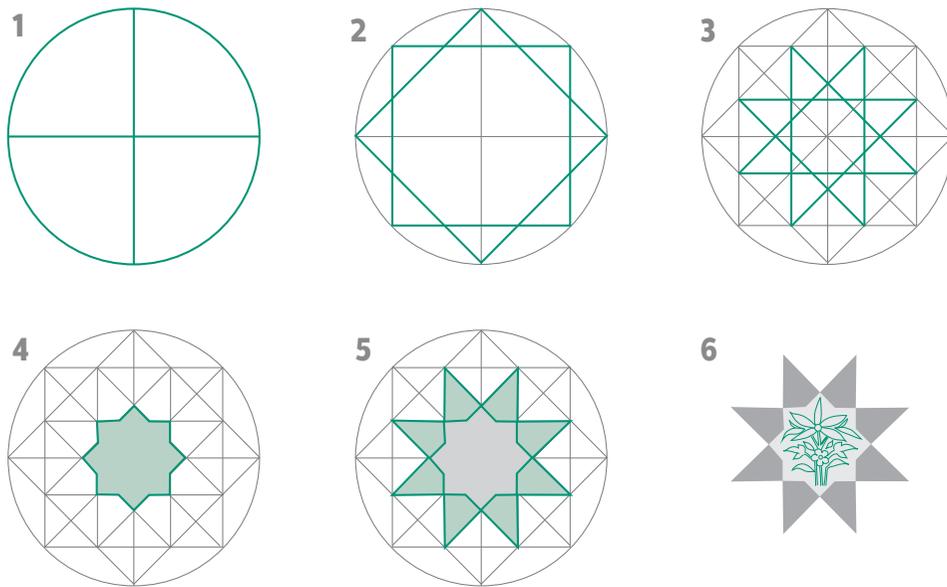


Figure 23:
Creating a design based on the Qur'an in Figure 22.

1. Draw a circle and two intersecting lines at right angles.
2. Draw two squares within the circle, one at 45 degrees to the other.
3. Use the circle and squares to create an eight-pointed star.
4. Colour the inner eight-pointed star.
5. Colour the outer eight-pointed star differently.
6. Create a design within the inner star and colour it in.

Students can continue this pattern-making activity by going back to the original Qur'an folio and studying it, then drawing more of the design, adding the stars, and using colours taken from the original folio. Or students can try creating their own geometric design, starting with step 2 and experimenting with different star and polygon shapes. Steps 1 to 5 can be done in *Geometer's Sketchpad* and then the design can be printed for the completion of step 6.



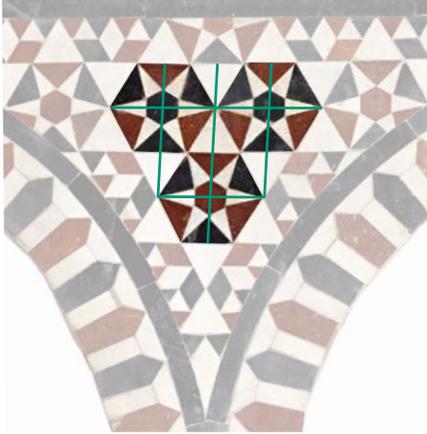
LEARNING FROM THREE-DIMENSIONAL OBJECTS 1



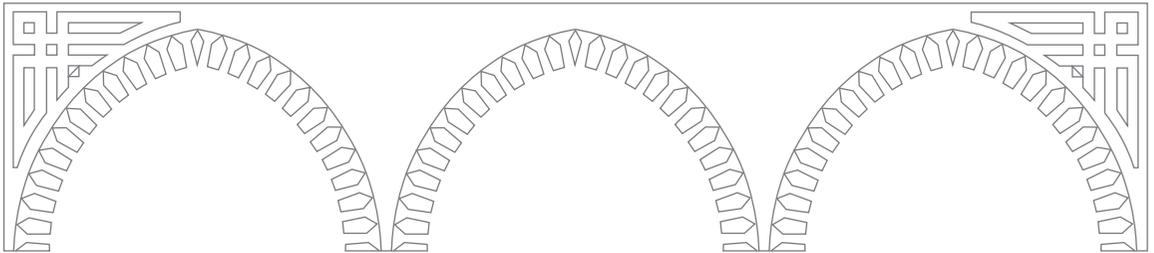
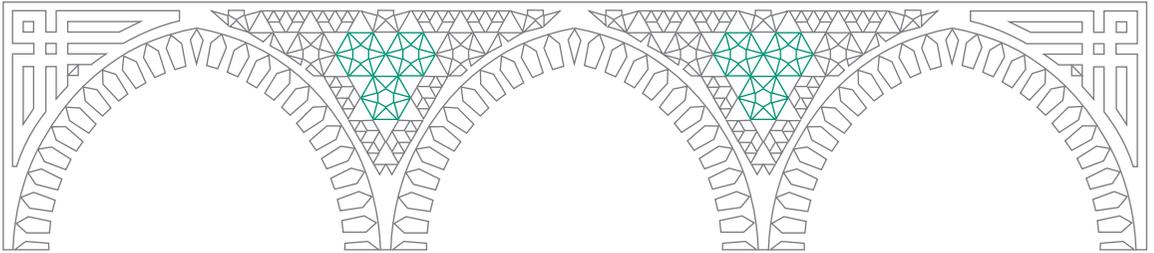
Figure 24:
Panel
Egypt, 15th century
Marble and stone mosaic
225 x 49 x 5 cm
AKM571

Typical of the decorative approach to stone, the triple-arched wall panel in Figure 24 uses the natural variety of stone colours to produce intricate polychrome compositions. Different stones and marble were cut according to the desired design, here forming a star-and-hexagon mosaic with knot-like interlace on the end spandrels. This panel would have decorated a reception room in a residential building in Egypt or Syria of the Mamluk period (1250–1517), where arched panels, similar to this one, separated the central hall with its gushing fountain from the two raised reception areas that flanked it.





Figures 25a and 25b:
Diagrams of Figure 24
with and without patterns.



Did You Know?

The patterns on the panel in Figure 24 are not painted on but composed of individual stone pieces meticulously cut to fit. To make the panel, artisans would have cut all the pieces from different coloured stones, laid down all the stones in the desired pattern, poured plaster over them, let it harden, and raised the panel to its standing placement.

CURRICULUM EXPECTATIONS AND KEY UNDERSTANDINGS

VISUAL ART

OME Expectation	Key Understanding
Develop an understanding of the elements of design. Learn to use them in creative work.	Developing Creativity, Communicating: Works of art communicate thoughts, feelings, and ideas, and an understanding of the elements and principles of design supports both the creation and analysis of works of art.
Develop an understanding of the principles of design, with a focus on emphasis (Grade 4), proportion (Grade 5), and balance (Grade 6). Learn to use them in creative work.	

MATHEMATICS

OME Expectation	Key Understanding
Geometry and Spatial Sense: Identify and classify the symmetry operations of reflection (Grade 4), translation (Grade 5), and rotation (Grade 6).	Geometric objects have properties that allow them to be classified in a variety of ways.
Patterning and Algebra: Extend and create repeating two-dimensional patterns involving reflections (Grade 4), translations (Grade 5), and rotations (Grade 6).	The symmetry operations of reflection, translation, and rotation are the rules according to which patterns are constructed.



SCIENCE AND TECHNOLOGY

OME Expectation	Key Understanding
Earth and Space: Assess the social and environmental impacts of human uses of rocks and minerals (Grade 4).	The properties of rocks and minerals determine society's possible uses for them.

CROSS-CURRICULAR CONNECTIONS

OME Expectation	Key Understanding
Visual Art and Mathematics: Develop an understanding of the ways artists combine the elements and principles of design with the mathematical principles of patterning and geometry to produce works of art.	An artist needs to use mathematical skills to make patterned works of art.

LEARNING THROUGH INQUIRY AND LEARNING BY DOING: PROMPTS AND ACTIVITIES

Visual Art

- Use the diagram in Figure 25a to try different colour combinations and shapes. What is the effect of a dark background? Of different shapes? Can you find shapes that fit together tighter than the ones the artist chose? What happens if you use different shapes on each of the three arches?

Mathematics

- If you use different shapes for the decorations in the previous art activity, how do you divide up the spaces to calculate how to fill them with a repeating pattern of shapes?
- Grades 4 and 5: How many reflections can you find in this mosaic pattern? Draw the lines of reflection as in the diagram of the panel in Figure 25b. What are the components of the six-pointed stars? How would you reconfigure them into another pattern?
- Grade 5: How many translations can you find in this mosaic? How have the various components of the pattern been fitted into the arch shape?

Science

- Earth and Space: What are the qualities of the rocks and minerals used in this wall panel? How were they mined? How were they constructed into the final shape? Try making a segment of the panel in a new material, such as carved Styrofoam, and compare its qualities to the original.



LEARNING FROM THREE-DIMENSIONAL OBJECTS 2



Figure 26:
Tile Panel
Central Asia, 14th century
Earthenware, carved and glazed
56 x 39 cm
AKM572

The ceramic tile in Figure 26 is a fine example of the flexibility and creativity of the ceramic workers of Iran and Central Asia: it uses two different techniques to achieve its final effect, which melds their two styles seamlessly. In the main field, the team of ceramicists created a geometric strapwork design in dark blue, turquoise, and white using a technique similar to *cuerda seca* (“dry cord”), in which the coloured glazes were prevented from running by the use of a greasy substance that burns off during firing – the “dry cord.”



The turquoise frame has an abstract vegetal motif of a continuously unfolding vine that was deeply hand-carved into the surface of the tile. This frame surrounds a perfectly balanced geometric interlace with a star pattern incised in its central field. The carving was done while the tile was still soft, with the glazing applied in the form of powdered minerals fused into shiny glazes of different colours when baked in the kiln.

Did You Know?

Tile panels like the one in Figure 26 covered architectural surfaces during the Timurid era in Central Asia, creating a patterned cloak of glittering blue. Figure 27 shows this effect in a building in Samarqand.



Figure 27:
Shah-e Zنده Complex
Samarqand, Uzbekistan
Source: <http://archnet.org>

CURRICULUM EXPECTATIONS AND KEY UNDERSTANDINGS

VISUAL ART

OME Expectation	Key Understanding
<p>Develop an understanding of the elements of design. Learn to use them in creative work.</p> <p>Develop an understanding of the principles of design, with a focus on emphasis (Grade 4), proportion (Grade 5), and balance (Grade 6). Learn to use them in creative work.</p>	<p>Developing Creativity, Communicating: Works of art communicate thoughts, feelings, and ideas, and an understanding of the elements and principles of design supports both the creation and analysis of works of art.</p>

MATHEMATICS

OME Expectation	Key Understanding
Geometry and Spatial Sense: Identify and classify the symmetry operations of reflection (Grade 4), translation (Grade 5), and rotation (Grade 6).	Geometric objects have properties that allow them to be classified in a variety of ways.
Patterning and Algebra: Extend and create repeating two-dimensional patterns involving reflections (Grade 4), translations (Grade 5), and rotations (Grade 6).	The symmetry operations of reflection, translation, and rotation are the rules according to which patterns are constructed.

CROSS-CURRICULAR CONNECTIONS

OME Expectation	Key Understanding
Visual Art and Mathematics: Develop an understanding of the ways artists combine the elements and principles of design with the mathematical principles of patterning and geometry to produce works of art.	An artist needs to use mathematical skills to make patterned works of art.

LEARNING THROUGH INQUIRY AND LEARNING BY DOING: PROMPTS AND ACTIVITIES



Figure 28:
Detail of the tile panel in Figure 26.

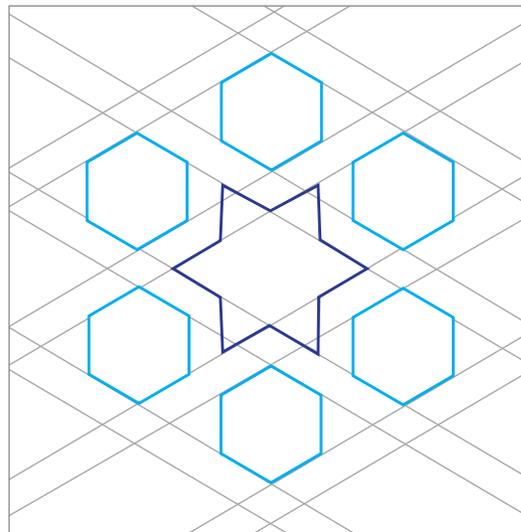


Figure 29:
Diagram of Figure 28.



Visual Art

- Figure 28 is a line drawing of the detail in Figure 26. Think of the design as being composed of three regions: the star and six hexagons, the thick diagonal lines, and the background. Make copies and try different colour combinations in all three regions. What is the effect of making the star and hexagons dark and the thick lines light? What is the effect of colouring the background in a light colour and the thick lines in a dark colour? Can you find a combination of three colours or lightness/darkness of a colour that you are happy with?
- Notice how the thick diagonal lines around the star and hexagons go over and under each other as threads do in woven cloth, or like ribs in a basket. Try drawing this effect yourself. How do you have to change the diagram in Figure 29?

Mathematics

- Grade 6: How many reflections, translations, and rotations can you find in the ceramic tile in Figure 26?
- Identify the angle of rotation. How would you turn the rotation into a reflection?
Hint: look at the interlacements.



LEARNING FROM THREE-DIMENSIONAL OBJECTS 3



Figure 30:
Dish
Iznik, Turkey, 1560–85
Fritware, underglaze-painted
Diameter 29 cm
AKM867

The dish in Figure 30 has an international heritage: its distinctive style was developed during the Ottoman Empire and was called Iznik after the centre in Turkey where it was made, but the style makes use of two prior inventions. The opaque white glaze comes from 9th-century Iraq; it was invented to mimic the hard white clays of Chinese ceramics. The body of fritware clay was invented in the 11th century in Iran. It has a high percentage of glass that makes it easy to mould; once air-dried, it can be smoothed and polished. The decoration is international, as well; the blue-and-white palette and the cloudlike forms in the border are adapted from sought-after 14th-century Chinese vessels, but the addition of red in the glaze and tulips in the design make this dish unmistakably Iznik.



Did You Know?

Tulips were introduced into Europe from Turkey in the 16th century. Their introduction caused an interesting phenomenon known as “Tulipmania.” It gripped Holland when tulip bulbs first arrived, causing intense trading and speculation. At first the market expanded in value, then it unexpectedly collapsed a century later when an outbreak of bubonic plague in Haarlem closed a tulip auction.

CURRICULUM EXPECTATIONS AND KEY UNDERSTANDINGS

VISUAL ART

OME Expectation	Key Understanding
Develop an understanding of the elements of design. Learn to use them in creative work.	Developing Creativity, Communicating: Works of art communicate thoughts, feelings, and ideas, and an understanding of the elements and principles of design supports both the creation and analysis of works of art.
Develop an understanding of the principles of design, with a focus on emphasis (Grade 4), proportion (Grade 5), and balance (Grade 6). Learn to use them in creative work.	

MATHEMATICS

OME Expectation	Key Understanding
Geometry and Spatial Sense: Identify and classify the symmetry operations of reflection (Grade 4), translation (Grade 5), and rotation (Grade 6).	Geometric objects have properties that allow them to be classified in a variety of ways.
Patterning and Algebra: Extend and create repeating two-dimensional patterns involving reflections (Grade 4), translations (Grade 5), and rotations (Grade 6).	The symmetry operations of reflection, translation, and rotation are the rules according to which patterns are constructed.

SCIENCE AND TECHNOLOGY

OME Expectation	Key Understanding
Earth and Space: Assess the social and environmental impacts of human uses of rocks and minerals (Grade 4).	The properties of rocks and minerals determine society's possible uses for them.
Matter and Energy: Demonstrate an understanding of changes of state and changes of matter by physical and chemical changes (Grade 5).	Chemical change implies the formation of a new substance.

CROSS-CURRICULAR CONNECTIONS

OME Expectation	Key Understanding
Visual Art and Mathematics: Develop an understanding of the ways artists combine the elements and principles of design with the mathematical principles of patterning and geometry to produce works of art.	An artist needs to use mathematical skills to make patterned works of art.

LEARNING THROUGH INQUIRY AND LEARNING BY DOING: PROMPTS AND ACTIVITIES

Science and Technology

- Understanding Matter and Energy: Properties and Changes in Matter (Grade 5): Investigate the dish in Figure 30 from the perspective of the state changes it has undergone in its making. How has the change from soft and wet to hard, dry, and impermeable made it useful for its particular tasks? Is the change a physical change or a chemical change? Explore vitrification (from solid to liquid to solid).



Mathematics

- Patterning and Algebra: First, identify the symmetry operations in the Iznik dish in Figure 30.



Figure 31:
The petals (left) have slight rotational symmetry (centre), the tulips have nine-point radial reflectional symmetry, and (right) the border has six-point translational symmetry.

Use the same motifs in Figure 31 to create your own design, but with a two-dimensional infinite repeat pattern as opposed to the two-dimensional finite (radial) pattern on the dish. You may change the colours if you wish.

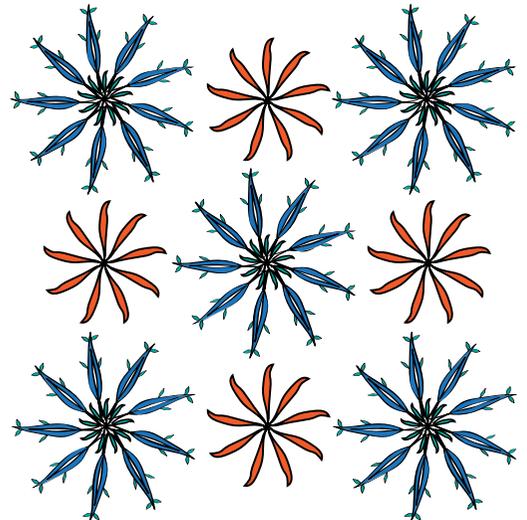
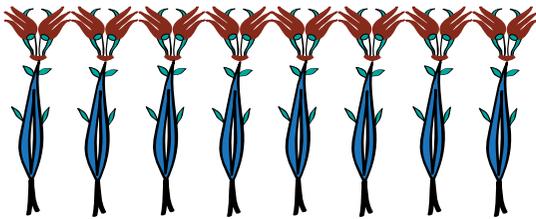


Figure 32:
Two possible two-dimensional patterns from the motifs on the Iznik dish in Figure 30.



LEARNING FROM PERFORMING ARTS



Figures 33a and 33b:
Leher (On the Tide),
Tehreema Mitha Dance Company.
Photographs by Aabvaan Barron.



Artistic Director Tehreema Mitha, originally from Pakistan, has been choreographing and performing dance professionally for more than 22 years. She brings a repertoire of more than 60 dances to the Tehreema Mitha Dance Company, a pioneering South Asian troupe based in the United States known for its signature presentations and unique style. The company’s programs include dances from the classical repertoire, moving fluidly into the classical/contemporary, and onto contemporary dances. Mitha believes that seeing all three styles on the stage in the same evening shows the progression of a generation in sync with the world of today yet unwilling to leave its roots behind, forging ahead without losing its identity.

CURRICULUM EXPECTATIONS AND KEY UNDERSTANDINGS

DANCE, DRAMA, AND MUSIC

OME Expectation	Key Understanding
Extend an understanding of the elements of dance, with particular attention to time and energy (Grade 4), and relationship (Grade 5).	Developing Creativity: The elements of dance are used in a variety of ways to create dance compositions. Understanding Culture, Making Connections:
Demonstrate an awareness of musical forms and traditions across cultures.	People around the world create and perform dances and dramas and create and play music.

CROSS-CURRICULAR CONNECTIONS

OME Expectation	Key Understanding
Dance and Language: Demonstrate an understanding of the narrative and socio-cultural aspects of dance as an expressive art form.	Dance can communicate ideas, messages, feeling, and stories. Dance is often used to communicate social and cultural beliefs and traditions.

LEARNING THROUGH INQUIRY AND LEARNING BY DOING: PROMPTS AND ACTIVITIES

- Dance: What kinds of relationships do the dancers have with each other? What kinds of relationships do the dancers have with their performing space?
- Music: What kinds of percussive metres did you hear in the music? Try beating them out, then compare them to the metres in the music you listen to at home or with your friends.

