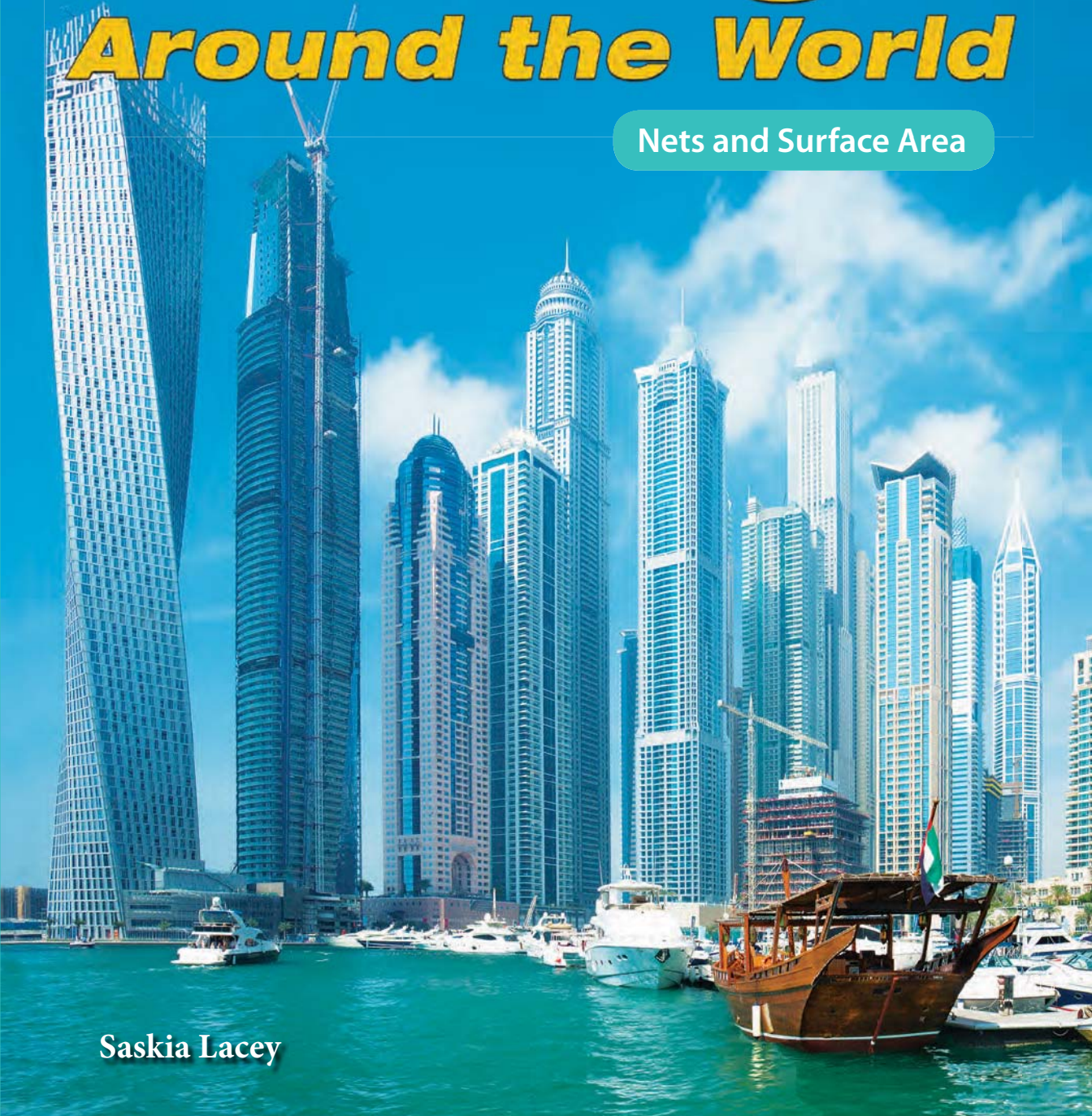




Engineering Marvels

Buildings Around the World

Nets and Surface Area



Saskia Lacey

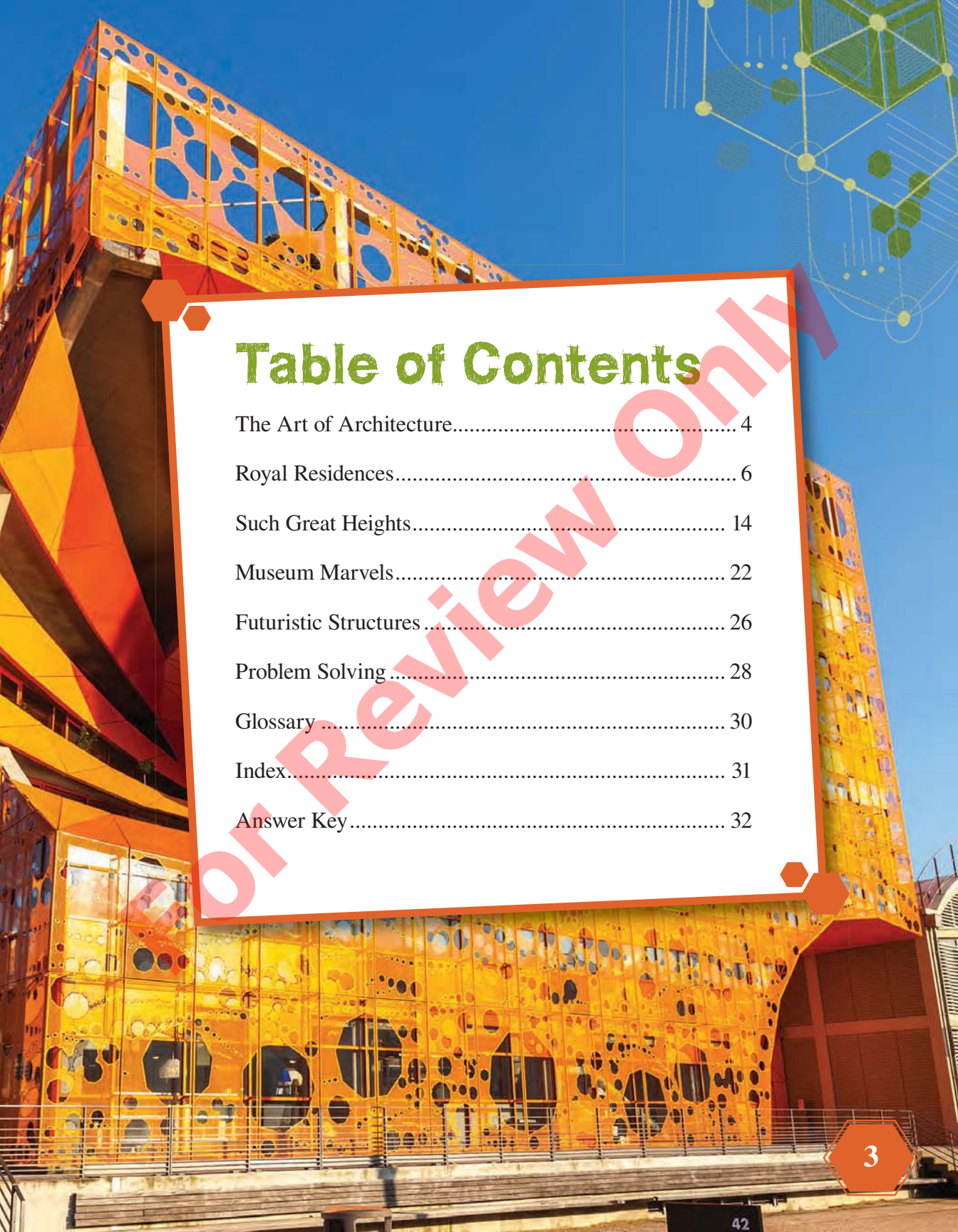


Table of Contents

The Art of Architecture.....	4
Royal Residences.....	6
Such Great Heights.....	14
Museum Marvels.....	22
Futuristic Structures.....	26
Problem Solving.....	28
Glossary.....	30
Index.....	31
Answer Key.....	32

The Art of Architecture

From home to school and back again, many of us spend our days moving from building to building. We visit them to read books, watch movies, eat meals, and spend time with friends and family. They are the places in which we live, learn, and grow.

Many modern-day buildings are basic **structures**. Explore your neighborhood, and you may find that many buildings look **alike**. They may have the same style or be similar in size; it's **unusual** to find a skyscraper in the middle of a small town! Schools, offices, coffee shops, theaters, and other **structures** are buildings created for a specific purpose. They encourage learning and working, create a sense of community, or provide a place to enjoy art.

But other buildings are defined by **more than** just their purpose or by what they contain. They are not **just buildings** but works of art too. They are inventive structures, **designed by architects** who have tried something new or have done **something** old in a new way. Starting with a sketch, architects design **unique** structures such as the Empire State Building, Burj Khalifa (**BOORJ** kah-LEE-fah), and Museo Soumaya (moo-SAY-oh sohu-MAH-yah). Each of these buildings is an example of architectural art. **The buildings themselves** are not the only things that stand the test of time. The stories behind the **architecture** also endure.



Museo Soumaya is in the Polanco neighborhood of Mexico City.

A full-page photograph of the Burj Khalifa skyscraper in Dubai, United Arab Emirates. The building is a tall, slender, tapering structure with a glass facade, reaching high into a bright blue sky with scattered white clouds. At the base, other city buildings and a yellow structure are visible. A large, diagonal watermark reading "For Review Only" is overlaid across the center of the image. In the top right corner, there is a decorative graphic of a red molecular or network structure. A small white text box is positioned on the right side of the building, and a red hexagonal page number is in the bottom right corner.

**Burj Khalifa soars above
Dubai, United Arab Emirates.**

Royal Residences

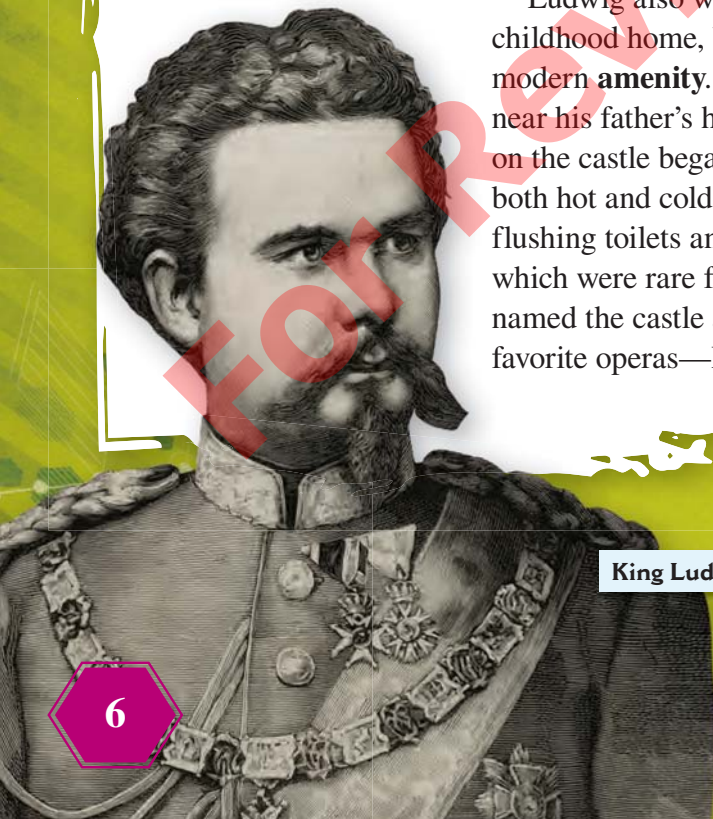
Throughout time, kings and queens have lived in stony castles and grand palaces. Their homes from long ago still stand as pillars of strength and extravagance. The stories of these royal residences make these buildings a few of the most memorable in the world.

Neuschwanstein Castle

On a rocky ledge in the Bavarian Alps of Germany, a castle floats above the treetops. With its grand, medieval architecture, the towers and **turrets** seem like they belong in an old fairy tale. This is Neuschwanstein (noy-SHVAN-shtine) Castle.

King Ludwig II was known as “Mad King Ludwig.” He was a **recluse** who loved theater and opera. In fact, his **love** of music bordered on obsession. The king longed to build a **palace** that reflected the beauty of his beloved songs.

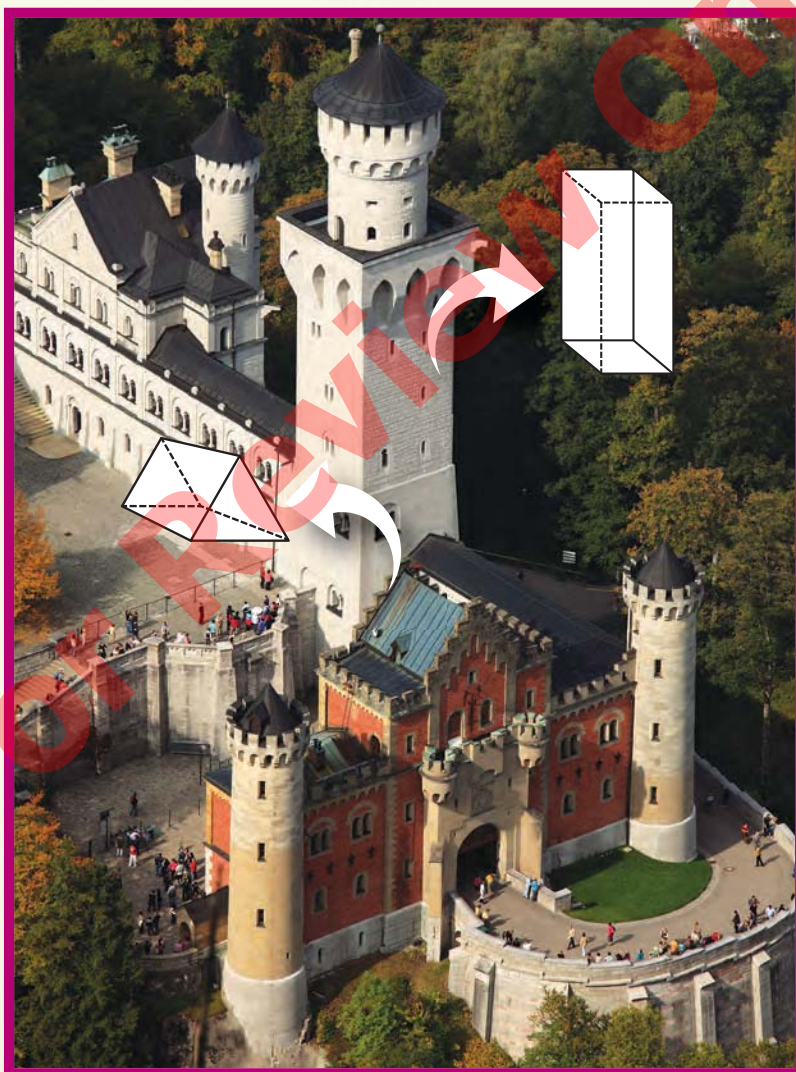
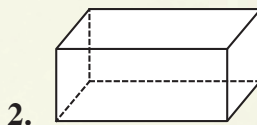
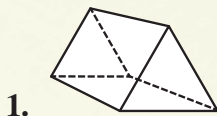
Ludwig also wanted a palace that resembled his childhood home, but he wanted access to every modern **amenity**. So, he **commissioned** a castle near his father’s home to be rebuilt. Construction on the castle began in 1868. Running water, both hot and cold, was installed. The palace had flushing toilets and an elevator. Telephone lines, which were rare for the time, were installed. He named the castle after a character from one of his favorite operas—Neuschwanstein.



King Ludwig II of Bavaria

LET'S EXPLORE MATH

Describe the two-dimensional faces needed to create each of the three-dimensional figures used in some Neuschwanstein Castle structures. Identify each figure.



The contrast between ancient and modern is what makes Neuschwanstein Castle truly unique. Inside Ludwig's royal apartment are a lavish **salon** and a study. There is even a room that looks like a **dripstone cave**. The room is a perfect example of Ludwig's **eccentricity**.

To celebrate his love of theater, King Ludwig II adorned his castle with scenes from his favorite operas. Christian Jank, a theater designer, even drew the original plans for the castle. The result is a castle that makes all of its visitors feel like they are stepping onto a stage.

To many, this castle may seem oddly familiar. That's for good reason. The castle inspired Walt Disney. He modeled Sleeping Beauty's castle after King Ludwig's palace!

Neuschwanstein Castle



dripstone cave room in Neuschwanstein Castle



Forbidden City

Beijing is also home to a royal residence. During the **imperial** age of China, work began on the Forbidden City (so called because only certain people were allowed inside). It was the time of the Ming **dynasty**, over six hundred years ago.

Yongle was the third emperor of the Ming dynasty. He commissioned the ancient royal city. To this day, it is the largest palace complex in the world. The Forbidden City is made up of nearly one thousand buildings. Many of the palace's buildings look alike. The importance of each building can be judged by its size. Buildings of greater length and width are likely to have been more important than their smaller counterparts.

the Hall of Supreme Harmony
in the Forbidden City

