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Text: Danielle Waller Research: Ankur Patel, Hiten Mehta Design: Sadhu ShreejiSwarup Das Educational Standards: Carrie Bohnert

### About this Guide

This Educator Guide for the giant screen film "Mystic India" is appropriate for students in grades 3 through 8. The guide includes pre- and post-activities to enhance your students' understanding of "Mystic India." Each section includes background information and activities, along with clear learning objectives. All activities and content provided adhere to National Education Standards, which are outlined in the chart on page 3.

#### Additional resources

www.goidirectory.nic.in A Government of India directory

www.tourismofindia.com Indian government tourist office site

www.swaminarayan.org/festivals Find details on all major Indian festivals.

www.cia.gov/cia/publications/factbook/index.html Facts for each country of the world as prepared for the CIA.





### About the Film

"Mystic India" tells the true story of Neelkanth who, at age 11, set out alone on a seven-year journey across India, dressed only in a loincloth. India's festivals and traditions come to life on screen through song and dance, and the beauty and precision of India's architecture - including the perfectly proportioned Taj Mahal demonstrate the mathematical skills used to construct ancient monuments. Along the way, Neelkanth experiences the harshness of India's land, which contains every type of habitat on Earth - from the freezing temperatures of the Himalayas to the scorching hot deserts to dense tropical rainforests - staying committed to a life of yoga and self-discipline while sharing his insights with others. In exploring India, a land of 1 billion people who speak 18 separate languages, the message of unity in diversity is stressed - an important message to Neelkanth, who became a great reformer of India, dispelling violence and social divisions while stressing a reverence for all forms of life. Unity in diversity is the central message of "Mystic India," that people of all nationalities are part of the same family, that "we all share the same sky, walk the same earth, and breathe the same air."

#### About Neelkanth

At age 11, Neelkanth - who had mastered the scriptures at age seven - set out alone on a seven-year journey across India, dressed only in a loincloth. He struggled through many hardships, enduring extremely cold temperatures and encountering wild beasts in the forests - carrying nothing to protect himself - all because he wanted to help people learn to live good lives.

Using the powers of deep meditation, the child yogi endured the bitter cold of the Himalayan

Mountains, walking barefoot as snow and ice crunched under his feet and even bathing in icecovered water. Neelkanth's survival may have been due, in part, to a system of meditation known as "Tum-mo" or "inner fire," which has been known to raise people's temperatures by as much as 17 degrees, according to a study by Harvard Medical School. Neelkanth's seven-year journey ended in Loj, where he was named Swaminarayan. Transforming society, he dug wells and ponds for the poor and personally distributed food to the needy. He urged people to treat women with respect and ended female infanticide, a practice in which newborn baby girls were drowned in pots of milk. Neelkanth constructed six beautiful temples in his lifetime of 49 years, till 1830.



# NATIONAL EDUCATION STANDARDS

	GRADES 3- 4	GRADES 5-8
CIVICS	Other Nations and World Affairs	Other Nations and World Affairs
	NSS-C.K-4.4	NSS-C.5-8.4
GEOGRAPHY	Places and Regions	Places and Regions
	NSS-G.K-12.2	NSS-G.K-12.2
	Human Systems	Human Systems
	NSS-G.K-12.4	NSS-G.K-12.4
	The Uses of Geography	The Uses of Geography
	NSS-G.K-12.6	NSS-G.K-12.6
WORLD HISTORY		"Era 4: Expanding Zones of
		Exchange and Encounter, 300-1000 CE"
		NSS-WH.5-12.4
		"Era 5: Intensified Hemispheric
		Interactions, 1000-1500 CE"
		NSS-WH.5-12.5
SCIENCE	Personal and Social Perspectives	Personal and Social Perspectives
	NS.K-4.6	NS.5-8.6
FOREIGN LANGUAGE	Cultures	Cultures
	NL-FL.K-12.2	NF-FL.K-12.2
	Comparisons	Comparisons
	NL-FL.K-12.4	NL-FL.K-12.4
ENGLISH	Multicultural Understanding	Multicultural Understanding
	NL-ENG.K-12.9	NL-ENG.K-12.9
VISUAL ART	Understanding the Visual Arts in	Understanding the Visual Arts in
	Relation to History and Cultures	Relation to History and Cultures
	NA-VA.K-4.4	NA-VA.5-8.4
MUSIC	Understanding Music in	Understanding Music in
	Relation to History and Culture	Relation to History and Culture
	NA-M.K-4.9	NA-M.5-8.9
DANCE	Dance in Various Cultures	Demonstrating and Understanding Dance in
	and Historical Periods	Various Cultures and Historical Periods
	NA-D.K-4.5	NA-D.5-8.5

The above grid provides information about the topics covered in the Educator's Guide, in connection with the U.S. National Educational Standards. Detailed descriptions relevant to the Guide, as well as the topics covered in the film, can be found in PDF documents on the Mystic India website, www.mysticindia.com, or from your local theater. Connections to the standards in the United Kingdom are also available on the website.

# PRE-SCREENINGPOST-SCREENINGACTIVITIESACTIVITIES

1. What do students already know about India? Make a list of students' knowledge of India on a large poster board or on the chalkboard. The following are suggested questions:

A. Where is India?

10 AL 10

- B. What shape is India?
- C. What countries and bodies of water border India?
- D. What is India known for?
- E. How old is the Indian civilization?
- F. What is the capital of India?
- G. What does India's flag look like?
- H. What are India's major geographic features?
- I. What is the weather like in India?
- J. What languages are spoken in India?
- K. What is the population of India?
- L. What form of government does India have?
- M. What animals are associated with India?

2. Using the questions above as a guide, work with your class to create a master table containing the following categories: "What We Know About India," "What We Don't Know," and "What We Want to Learn." Use the chart as a guide for exploring India further. 1. After watching the film, review the table the class created in pre-screening activity #2. Ask them if anything they learned in "Mystic India" helped them answer some of the questions in the "What We Don't Know" category. Suggested teaching resources are listed in the front of this guide.

2. Have your students write a review of the film and present it to the class. Review components should include the film's storyline, theme, acting quality, scenes and special effects, and what the students liked or disliked about the film.

> INDIA Kaglak Mira

Send us some reviews from your class and we'll post them on our website, www.mysticindia.com!

## INDIA'S VARIED HABITATS

India, the seventh largest country in the world, contains nearly every type of habitat on Earth. In the north are the towering Himalayan Mountains, the highest mountain system in the world. On the east coast is the Bay of Bengal and to the west, the Arabian Sea. The country's southernmost tip reaches into the Indian Ocean. In addition to mountains, plains and seas, India boasts the Thar Desert in the west and the marshlands of Kutch to the south. On the east is the world's largest delta, where the Ganges River drains into the Bay of Bengal.

#### Climates

India's climate ranges from tropical to arctic, depending on the region. India's diverse climate is due to its shape, unusual topography and geographical position. While most of India has a tropical or subtropical climate year-round, the northern plains experience a wider range, with cooler winters and hotter summers. In the mountains, there are cold winters and cool summers, with climate type changing within a few miles, from subtropical to polar, depending on the elevation. India's hot and dry season peaks in May, when temperatures climb as high as 120 degrees. The intense heat ends with the summer monsoon season, which lasts from mid-June through September. India's economy depends on the monsoon. Without it, there are poor harvests or none at all, which can lead to famine.

#### **Plant Life**

India's wide range of climates supports many diverse species of plant and animal life. India has an estimated 45,000 species of plants, including six percent of the world's flowering plant species. Plant life ranges from capers (spiny shrubs with pale flowers) and jujubes (fruit-producing trees with yellowish flowers), which are common, to bamboo. The Malabar Coast, a long narrrow plain located on the Arabian Sea in southwestern India, receives vast amounts of rainfall. The coast is a thickly wooded area featuring evergreens, bamboo and teak trees.

#### Animal Life

India's animal life features about 5,000 species of larger animals, including lions, tigers, panthers, wolves, snow leopards, elephants, rhinoceroses, black bears, wild buffalo and several species of monkeys. Venomous reptiles, including the cobra, are numerous, and India's rivers and coastal waters include many edible varieties of fish.







# HABITAT ACTIVITIES

Objective: To provide a personal connection between the students and the country of India through real-world challenges.

1. How would you get to India? Investigate possibilities by land, air and sea, and then plan a route. Include distance traveled, countries crossed, and conditions endured, including temperatures and terrain.

2. In "Mystic India," we see Neelkanth crossing the Himalayas. Discuss the difficulties of living in a mountainous region like the Himalayas.

**3.** Produce a class display map of India. Divide the class into groups, each researching different aspects of India. The map could include physical features, weather, climate and borders.

Ancient India







### MATHEMATICS

"It is true that -- even across the Himalayan barrier -- India has sent to the West such gifts as grammar and logic, philosophy and fables, hypnotism and chess and, above all, the numerals and the decimal system."

Will Durant, American historian (1885 - 1981)

India has made several significant contributions to the field of mathematics, though many of its contributions are attributed to others, often

> centuries after the concepts were first discovered in India. Written records illustrate the early discoveries of India's scholars, including the Zero, the decimal system, the value of Pi, geometry and trigonometry.

#### Zero

India made a significant contribution to the numeral system with its discovery of the Zero. Without it, we wouldn't have computers and counting would be difficult. The earliest written evidence of the concept comes from an Indian text, Lokavibhaaga ("The Parts of the Universe"), which dates to 458 B.C. The Zero is explained in Arabic texts dating to 770 A.D. From these writings, the Zero was carried to Europe in the 8th century. Since the Roman numeral system was widely used at the time, the concept of zero did not find widespread acceptance until the 17th century.

#### The Decimal System

"It was India that gave us the ingenious method of expressing all numbers by means of ten symbols (decimal system), a profound and important idea which escaped the genius of Archimedes and Appolonius, two of the greatest men produced by antiguity." - La Place

Through its discovery of the zero, India established a base ten system of numbers very early on. Indian mathematicians also were the first to discover an effective way to represent numbers ranging from tiny decimals to extremely large numbers. India's discovery that large numbers could be represented as powers of 10, along with written names for each of the numbers, up to the 12th power, were found in Vedic texts written at least 1,000 years before Euclid.

#### The Value of Pi in India

The ratio of the circumference and the diameter of a circle is known as Pi, which gives its value as 3.1428571. The old Sanskrit text "Baudhayana Shulba Sutra" of 6th century BC mentions this ratio to be approximately 3. Aryabhatt in 499 A.D. worked out the value of Pi to the fourth decimal place as 3.1416. Centuries later, in 825 A.D. Arab mathematician Mohammed Ibna Musa said, "This value has been given by the Hindus (Indians)."

#### Pythagorean Theorem or Baudhayana's Theorem?

The Pythagorean Theorem\* - the square of the hypotenuse of a right-angled triangle equals the sum of the square of the two sides - was discovered in 550 B.C. About 5,000 years earlier, Baudhayana worked out the equation in 'Baudhayana Sulba Sutra.' He describes, "The area produced by the diagonal of a rectangle is equal to the sum of the area produced by its own two sides."

\*This theorem by Euclid was attributed to Pythagoras by Greek writers.

#### Measurement of Time

In the Indian text "Surya Siddhanta," Bhaskaracharaya calculates the time taken for the Earth to orbit the sun to nine decimal places.

#### Bhaskaracharaya = 365.258756484 days

Modern accepted measurement = 365.2596 days Between Bhaskaracharaya's ancient measurement 1,500 years ago and the modern measurement, the difference is only 0.00085 days, or 0.0002%.

# Did You Know ?

Although Euclid is credited with the invention of geometry in 300 B.C., the concept emerged in India in 1000 B.C., from the use of square and rectangular shapes in making altars. The word geometry appears rooted in the Indian word Gyaamiti, which means measuring the Earth.

### MATHEMATICAL ACTIVITIES

Objective: To connect geography and math skills by encouraging students to think about mathematics from a non-western perspective.

#### **Vedic Mathematics**

1. Vedic Mathematics is founded on 16 principles, which can be applied in numerous ways to solve various problems.

Using the Indian principle, Nikhilam Navatash Charamandashatah ("All from nine and the last from ten"), solve the following equation.

#### 1,000 - 586

Instructions: Take the first two digits in the second number (586) and subtract each of them from 9 (i.e. 9-5, 9-8). Then take the last digit (6) and subtract it from 10. The answer is 414.

10° = 1,000 million = Koti
10<sup>13</sup> = 1 million million = Niyuta
10<sup>51</sup> = Vibhutangama
10<sup>53</sup> = Talakshana
10<sup>145</sup> = Dhvajagranishamani

This calculation works for subtractions from any number that has a 1 followed by zeros (100, 1,000, 10,000, etc.). When subtracting two digit numbers (83 or 45, for example), add a 0 in front (1,000 - 083 = 917).

2. Another Vedic math concept is called Urdvatiryag Bhyam, meaning "vertically and crosswise." Using this concept, you don't need multiplication tables past  $5 \times 5$ .

Suppose you need to multiply 8 × 7. Line up this equation vertically.

8

7

See how far each number is below 10 and place that number to the right of each.

### 8 2 7 3

Subtract crosswise (7-2 or 8-3 = 5) and multiply vertically, using the numbers in the second column (2 X 3 = 6). The answer is 56.

Try this concept using various equations.

3. Using the formula "By one more than the one before," you can easily square numbers that end in 5.

**75<sup>2</sup> =** 

When the number ends in 5, the last part of the answer is always 25. The first part is the first number (7) multiplied by the number "one more," which is 8.

Answer: 5625

Try this concept using various equations.



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### ARCHITECTURE & MONUMENTS

"Mystic India" explores India's many monuments, temples and palaces. The large, intricately designed structures were built thousands of years ago using architectural science and precise mathematical measurements. But how did ancient Indians learn how to build?

The Vastu Shastra, the science of architecture, is found in the Vedas, which are 8,500-year-old scriptures that describe nearly every aspect of construction, including materials, techniques, guidelines and a complex mathematical pattern linked to astronomy. Regular shapes make up the structure of intricately sculptures designed and monuments, and each shape's is significance clearly explained. Out of the need for perfectly proportioned architecture arose the development of geometry and complex number systems.

#### Surya Mandir

Mandir is the Indian name for a place of worship. Mandirs function as a center of the Indian community, as gathering places where people unite to serve society.

The Surya Mandir, built in 1027 A.D., is dedicated to Surya, the Sun God. Indians have worshipped the sun for centuries as a natural, life-giving resource. Using their knowledge of astronomy, the Indians built the Surya Mandir on a mound facing east so that, during the equinoxes, the rising sun shines straight through the temple doors into the sacred shrine. Geometrical knowledge allowed the Indians to devise a rectangular bathing area, with steps, using perfectly symmetrical stone slabs that fit into place like puzzle pieces, without use of mortar or cement. Fifty-two beautifully carved pillars, representing the number of weeks in a solar year, support the main area of the Mandir.

#### Astronomy

Indian astronomers have mapped the skies for 3,500 years. One thousand years before Copernicus published the Copernican system in 1543 (explaining the movement of the planets around the sun), Indian astronomer Aryabhatta wrote that the Earth is round, rotates on its axis, orbits the sun and is suspended in space. "Just as a person traveling in a boat feels that the trees on the bank are moving, people on the earth feel that the sun is moving," he wrote.



Kailas Temple, Ellora

Did You Know ?

The rock-cut Kailas temple at Ellora is the world's largest monolithic monument. It took 7,000 craftsmen to carve it, starting from the top of the hill of solid stone and chipping away

> downwards - for six generations - 150 years!

INININININ

ARCHITECTURE & MONUMENTS - ACTIVITIES



South Indian Temple Gate

12/2/12/12/12



East Indian Temple - Lingaraj



West Indian Temple - Somnath



North Indian Temple - Badrinath

Objective: The following activities are designed for the exploration of Indian architecture and the role of science and mathematics in the construction of ancient monuments.

1. Have your students build their own Mandirs, demonstrating their knowledge of Indian architectural styles. Use one of the following architectural styles:

- A. North Indian
- B. South Indian
- C. East Indian
- D. West Indian

Materials: Small boxes, plastic containers, Popsicle sticks, paint, markers, crayons

2. Ask students to identify the geometric patterns in the Taj Mahal and Sun Temple below.









undernance

10



# FESTIVALS & TRADITIONS

India is a land of 1,000 holy festivals and traditions expressing its diverse culture and customs. Festivals preserve the Indian traditions of music, dance, arts and crafts while bringing people together in a celebratory setting. Different nationalities, races, religions and backgrounds celebrate as one.

#### Holi: The Festival of Colors

Holi, celebrated in March, marks the arrival of spring. Men, women and children drench each other with water mixed with colored powder, to signify God painting over their sins. Fires are lit to keep away evil spirits.

#### Diwali: The Festival of Lights

Diwali, held at the end of November, is similar to Christmas celebrations in Western culture.

> People decorate their homes and businesses with colored lights, exchange gifts and enjoy large feasts with family and friends. Firecrackers and loud fireworks explode at night.

#### **Pooram: The Festival of Elephants**

Pooram is celebrated between the months of April and May in honor of Lord Vishnu. Decorated elephants, adorned with gold plated coverings and attached garlands, colorful umbrellas and hand fans, emerge from temples and are led on a midnight procession. The celebration closes with an early-morning fireworks display.

#### Onam: The Festival of Boats

Onam is a four-day festival held in the second half of August, commemorating the return of Mahabali, the Indians' once and future king. Women and girls celebrate by singing and dancing and young men race long snake boats. People also clean their houses and parents give gifts to their children.

#### Annakut: The Festival of Food

Held at the end of November, Annakut is a time for family reunions and large feasts, quite similar to Thanksgiving celebrations. In temples, hundreds of plates of delicacies are offered to God in return for blessings and a prosperous harvest. Annakut also marks the first day of the New Year.

#### Rath Yatra Festival

In "Mystic India," Neelkanth joins in the spectacular festival of Rath Yatra, held annually in early July. The festival, celebrated all over India, originated in Jagannath Puri, which houses one of the most sacred mandirs in eastern India. Each year, the sacred images of the Jagannath Mandir - Lord Krishna, Balaram and Subhadra are installed on huge chariots (Raths) and are pulled through the streets in a procession (Yatra). The festivities commemorate the day that Lord Krishna and his brother Balram left Gokul, their hometown, on a chariot. The local king demonstrates service to God by sweeping the road ahead of the procession with a golden broom. Almost 1 million people participate in the Rath Yatra each year.

#### FESTIVALS & TRADITIONS ACTIVITIE

Objective: Students experience and learn about some of India's greatest festivals and traditions.



Pooram : Festival of Elephants





Festival of Colors Holi



Diwali : Festival of Lights



BharataNatyam: Traditional Dance

1. What holidays do you like to celebrate? Investigate the reasons for particular celebrations, such as Hannukah, Easter, Christmas, St. Patrick's Day and Chinese New Year.

2. In "Mystic India," Neelkanth greets people with folded hands, a traditional Indian greeting that shows respect. Investigate different ways people greet each other in other parts of the world. Compare them to how you greet people in your own country.

3. You just learned about Annakut, the Festival of Food. Hold your own Annakut celebration in the classroom. Prepare food items that are traditional to your background or just pick your favorite food and share it with your classmates.

4. Try out the hand gestures given on the right in class, and try to imagine how they are part of a traditional dance. See the dance photograph (below, left) for clues.







#### Did you know?

Indian dance incorporates hand gestures and movements of eyes, using the whole body for expression. Hand gestures can represent or symbolize things, such as rivers, animals or people, and the movement of the head and eyes conveys mood and emotion. One of the oldest, most popular and widely performed dance forms is Bharata Natyam. Nurtured in southern India's temples and courts since ancient times, the style features a wide range of postures, movements and rhythms and is practiced today by male and female dancers all over India. Other Indian dance forms feature fast rhythmic footwork, large headdresses

and extraordinary costumes and

makeup.

# PEOPLE, FACES & LANGUAGES

India's 18 languages and 1,600 different dialects are a world record! Amidst the diversity of languages, customs and lifestyles exists a common thread of love, respect and hospitality. India's population is diverse as well as large, representing about 1/6 of the population worldwide!

#### **Common links**

Hinduism is India's primary religion and the world's oldest, at 8,500 years old. Its roots lie in the Indus valley, which had 300 advanced settlements as early as 5,000 B.C. People living near the Indus River became known as Hindus.

Hindus believe that God is present in all living things and that man is not limited to one birth, but can experience reincarnation and go on to live other lives. The goal of Hinduism, however, is to break the cycle of reincarnation to achieve eternal life, or ultimate liberation. Hindus strive to accomplish liberation through guidance and blessings of a spiritual master, or guru, and prayer to sacred images, which represent God's divine presence. Hinduism teaches people to live in harmony, stressing universal values including service, love, forgiveness, sacrifice, faith, tolerance and others.

#### Hindus

Comprising 81 percent of India's population, Hinduism has its roots in old religious texts, known as the Vedas. Hinduism stresses that by living a perfect life, people can be freed from materialism and join with the eternal.

#### **Buddhists**

Buddhists make up 2.5 percent of India's population. Buddha, born in Nepal 2,500 years ago, wandered the Ganges plain until achieving enlightenment. Buddhism went forth from India into Asia and is based on the Noble Truths: life is suffering; the cause of suffering is ignorant craving for wealth and transient pleasure; and that suffering can end following the eight-fold path.

#### Jains

Jains make up 2.5 percent of India's population. Jainism's founder, Vardhamana Mahavir, was one of Buddha's contemporaries. Jains describe the soul as crystal, pure and clean, growing dark with every evil act. Non-violence, or Ahisma, is the key to purity.

#### Muslims

The second largest majority in India, at 12 percent of the population, the Muslim religion is rooted in the seventh century. At the age of 40, Muslim prophet Muhammed is said to have received the word of God (Allah), which is written in the Koran. Many of India's 16th and 17th century rulers were Muslims.

#### Sikhs

The Sikhs, which make up 1.9 percent of India's population, honor one God and do not worship an idol. Sikh practices include wearing a turban and never cutting the hair or beard. During the rule of Muslim emperors, Sikhs were heavily persecuted.

#### Parsis

Parsis comprise 2.5 percent of India's population. The Parsi faith was founded in the 6th century by Zoroaster and is also called Zoroastrianism. Parsis worship one God, Ahura Mazda ("Lord Wisdom"), and believe that those who choose Truth, rather than Lie, in life will achieve eternal paradise. Parsi temples contain a small holy fire - which Parsis regard as purifying and sacred - that is kept continuously burning.



#### Jews

Found mainly in south India, Jews represent a very small community in India. India has had trade relations with the Middle East for 2,000 years, making it likely that a small group of traders made their home in South India. Jews believe in one God who created the universe and governs it, and that divine intelligence is infused into everyday life.

#### Christians

Found mainly in south and west India, Christians comprise 2.3 percent of India's population. Christianity was introduced by early traders and it is also believed that one of Jesus' 12 apostles, St. Thomas, came to India to preach and died in Chennai. Christianity was reintroduced with the rule of the British, who considered Indian beliefs to be backwards and sent missionaries to teach Indians about Christianity.

### ACTIVITIES

Objective: Introduce students to the diversity of Indian culture through its people, languages and religions.

1. Be a detective. How many languages do you encounter in one day? Go to the newspaper stand or library and look at the variety of languages you find there. Go online and search for newspapers in other languages.

2. Does anyone in your class speak another language? Learn how to say hello, goodbye and thank you in a variety of languages. Investigate the country from which each language originates. Compare each language to the English language.

3. At the end of "Mystic India," India's gift is revealed: "Unity in diversity, of co-existence, understanding and harmony." Ask students to discuss this message and develop ideas on how to implement the message in their daily lives. How is this message of use in today's world?

4. Read out the numbers below, given in different languages, and point out the similarities between them.

Providence and	END DESCRIPTION OF	Constant of the local division of the local		C. S. C.
ENGLISH	SANSKRIT		PERSIAN	LATIN
one	eka	एक	yak	unus
two	dva	द्व	du	duo
three	tri	त्री	sih	tres
four	chatur	चतुर	chahar	quattuor
five	pancha	पंच	panj	quinque
six	shat	शत	shash	sex
seven	sapta	सप्त	haft	septem
eight	ashta	अष्ट	hasht	octo
nine	nava	नव	nuh	novem
ten	dasha	दश	doh	decem

BAPS Swaminarayan Sanstha Mystic India Shahibaug, Ahmedabad - 380 004 Gujarat, INDIA

Tel: +1 732 777 1414