

ORBITA MAX-MACGILLIVRAY FREEMAN'S

MYSTERY OF THE NILE

EDUCATOR'S GUIDE



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“The Nile is the most magnificent river in the world. No other river can compare. And no other river in the world is as closely associated with a particular culture and society as is the Nile. Without the Nile there would be no Egypt, no pharaohs, no pyramids. The history of the western world is inextricably tied to this greatest of rivers.”

—PASQUALE SCATURRO, *Expedition Leader*

MYSTERY OF THE NILE is an IMAX® theatre film and a co-production of Orbita Max and MacGillivray Freeman Films. The films produced by MacGillivray Freeman Films offer educators a powerful teaching tool that is easily integrated into existing curriculum. In addition to meeting recognized educational standards, they provide students with unique and exciting opportunities to explore new worlds and new ideas.

Both the film and this guide offer an introductory experience for students working on a variety of subjects at a range of grade levels. The approach is premised on influencing the affective behavior of students, interesting and motivating them long after they have seen the film.

The Guide covers material that is particularly relevant for students studying environmental and ecological subjects including conservation, geography and geology, history, social studies, civics and even art and literature. In addition to national standards-based lessons for students in grades 6-8, there are enrichment activities, extensive background information, reference sources, directions for group activities and enough variety in the content to appeal to students with a wide range of abilities. Teachers are strongly encouraged to adapt the activities to meet the specific needs of the grades they teach and their students.

NATIONAL EDUCATION STANDARDS

GRADES	SUBJECT	STANDARD
4-6	Life Science	Know about the diversity & unity that characterizes life
3-5	Geography	Understand how human actions modify the environment
5-12	History	1b. Nile impact on development of early civilization
5-12	History	2b. Cultural/political connections between Egypt/Nubia
K-2	History	Tech 6. Transportation tailored to societies' means/needs
3-5	Geography	17. Applying geography to interpret past
K-12	English	English content standards, creative writing
6-8	Science	Ecology, bio-diversity, conservation, water quality

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Pasquale Scaturro guides an expedition raft through Class V Island Rapid in the Western Gorges section of Ethiopia.

ABOUT THE FILM

MYSTERY OF THE NILE is a cinematic adventure that takes audiences on an expedition down the world's greatest and most deadly river, the Blue Nile. For 114 days, a team of explorers led by Pasquale Scaturro and Gordon Brown face seemingly insurmountable challenges—class VI rapids, dangerous crocodiles and hippos, gunfire from bandits, malaria, and the fierce Saharan sun—as they make their way along all 3,260 miles of the river to become the first in history to complete a full descent of the Blue Nile from source to sea. Throughout the journey, the beauty and wonder of the magnificent Nile region are revealed as never before.

The story of this epic journey is the subject of a large format film, *MYSTERY OF THE NILE*, playing in IMAX theatres and other large format cinemas.

A BRIEF HISTORY OF NILE EXPLORATION

MYSTERY OF THE NILE captures the epic story and learning adventures of the team that became the first ever to navigate the waters of the Blue Nile from source to sea. But how is it that this “last of the great firsts” took so long to finally be accomplished?

It hasn't been for lack of trying. In fact, the Blue Nile has been an obsession that has driven many explorers—yet never with successful results. The massive Ethiopian rapids often stymied those without modern, world-class whitewater skills; the ever-shifting political situation often left explorers exposed to flying bullets, off-limits borders and insurmountable dangers; and numerous Blue Nile expeditions were spooked by the “terrible trio” of exploring: accidents, injuries and fatalities.

The entire history of Nile exploration is filled with legendary stories. Even in ancient Greece, the source of the Nile was considered one of the earth's most compelling mysteries, written about extensively by the 460 BC historian **Herodotus**, who believed the river sprang from between two massive mountains. Later, the **Emperor Nero** ordered his centurions to follow the Nile in search of this rumored source, though these brave early explorers were bogged down in the swampy marshes of the **Sudd** (near the Ugandan border) and got no further.

Historians explain that between the 4th and 17th centuries, the upper Nile in Ethiopia was largely forgotten by the rest of the world. Only missionaries, merchants and adventurers reached the Ethiopian highlands. By the 17th century, attracted by the legend of a Christian kingdom isolated in the heart of East Africa and surrounded by Islamic warriors, Portugal sent missionaries and soldiers to help the Ethiopian rulers and to protect the faith. It was the first contact for centuries between Europe and the old, exotic Ethiopian Christian kingdom (mentioned in some chronicles as the “Preste Juan” kingdom). The Portuguese built castles and bridges and provided cannons to ward off the Islamic soldiers. At that time, a Spanish missionary was the first to visit and describe the Tisissat Falls and the upper section of the Nile.

By the 19th Century, the great Victorian era of African exploration, finding the source of the Nile became known as “the Great Prize.” With the river's massive, maze-like structure, the source of all the water remained hidden from view, and many believed that finding it would hold out the quarry of tremendous hydrological power ready to be harnessed by the discoverer.

Some of the most courageous and innovative explorers of this era set out to accomplish this crowning achievement of human knowledge. Among those who searched are:

Padre Páez (-1622): This brave Spanish missionary, who was sent to Ethiopia in the beginning of the XVII century to convert the Ethiopian Orthodox Church to Catholicism and who became a close friend of the Emperor Susinios, travelled through the country undertaking many risky expeditions. He was the first westerner to “discover” and to describe the source of the Blue Nile. Páez saw the sources of the Blue Nile on April 21st, 1618: “I confess I feel fortunate and happy for seeing what Alexander the Great, Julius Caesar and the Kings Ciro and Cambesses desired to see in the past but never accomplished”. Padre Páez was a very humble person who never proclaimed his achievement as a “discovery.” He always explained and wrote in his notes that he “saw” the source of the Nile, given the Ethiopians already knew it and venerated its sacred waters. They called the source “Guish Abbay” and the first section of the Blue Nile the “Guelguel Abbay.” Padre Páez has been recognized in 2003 by the Ethiopian authorities as the first European to visit the source of the Blue Nile. Years after, the explorer James Bruce knew the story of Padre Páez, but still proclaimed himself as the “discoverer” of the Blue Nile source.

James Bruce (1730-94): This Scottish explorer set off from Cairo in 1768 and after a long, hard journey arrived at Lake Tana in 1770, confirming for the first time that this mountain lake is the origin of the Blue Nile—though at that time no one in Great Britain knew this was actually the primary source of the entire Nile River.



Samuel Baker (1821-1893): Baker was an English explorer who became the greatest expert on Egypt and Sudan of his day. His 1860s hunt for the source of the Nile led to the European discovery of Lake Albert in Central Africa.



Richard Burton (1821-1890): the legendary storyteller and explorer joined up with **John Hanning Speke** (1827-1864) in 1858, to search for rumored great lakes in Central Africa that might be the source of the Nile. Their journey took them to Lake Tanganyika and the challenging Mountains of the Moon. In mid-journey, Burton took ill and rested, while Speke pressed on, eventually becoming the first European to ever lay eyes on Lake Victoria, then considered the main source of the Nile.

Bruckhart Waldekker: A little-known German explorer, Waldekker quietly proved in 1937 that the main source of the Nile is the Ethiopian highlands, which contribute over 85% of the river’s water, while Lake Victoria contributes only 15%.

In the modern era, numerous expeditions have been attempted on the Blue Nile, with several intrepid river-runners attempting the dangerous route from Laka Tana to the Mediterranean Sea. Some of these have included:

1902 Expedition: American big-game hunter W.N. Macmillan and Norwegian explorer B.H. Jenson became the first to try to run the Blue Nile, but their boats were wrecked beyond repair almost immediately upon entering the strong current.

1968 Expedition: Emperor Haile Selassie of Ethiopia himself invited the British Army to attempt the first descent of the Blue Nile in 1968. A massive 60-man team was assembled by Captain John Blashford-Snell, who also had a support plane, Land Rovers and assault-style rafts at his disposal. Even so, the cumbersome expedition



soon met its match on the river. Many boiling rapids had to be by-passed and portaged. The team faced tragedy when one of their key members, Ian Macloed, drowned while trying to cross a tributary. They were then forced to evade attacks from bandits while camping in the Blue Nile Gorge, and evacuated the region.

1972 Expedition: A sleeker 4-man British team, under the leadership of highly experienced kayakers Mike Jones and Mick Hopkins, ran many of the monster white-water Ethiopian rapids that the 1968 expedition had found impossible. Nevertheless, they left the river after 12 days, after being attacked repeatedly by crocodiles and gun-wielding Shifta bandits.

1999 Expedition: This National Geographic Society expedition ran 500 miles of the Blue Nile from the headwaters of Lake Tana to the Sudanese border, the first time this length had been run in an unbroken journey. Veteran river runner Kelly Shannon led the journey which also ran into numerous hazards, including rapids that could not be run necessitating long portages through remote country. *National Geographic Magazine* depicted the area’s people and landscape in an article about the expedition—the first time Westerners had ever seen the spectacular beauty of the Blue Nile.

So why did Pasquale Scaturro and Gordon Brown succeed where all others have failed for thousands of years? Modern equipment, exceptional experience, strong wills and a healthy dose of luck



Pasquale Scaturro instructs hydrologist Mohammed Megahed how to rappel off of the top of Tissisat Falls.

all likely have something to do with it. But their triumph in paddling from the highlands of Ethiopia to the sea at Alexandria without disaster may simply be another *MYSTERY OF THE NILE*.

BACKGROUND INFORMATION ON THE NILE

The Nile as Refuge

The geographical diversity of the Nile is unmatched anywhere. From its volcanic and glacial birthplace in the mountains to where it plunges into the salt waters of the Mediterranean Sea, the Nile is characterized by variation. If “history exists with the consent of geography,” as the writer Will Durant has suggested, the Nile was destined to have an interesting life. From ancient times to the present, along the banks of this river, a huge and truly diverse human population has flourished. It is not surprising then to find that plant and animal life has been no less diverse.

Thousands of species of plants of every conceivable color, shape and size have established themselves and provide shelter and sustenance to an equally varied animal kingdom. It is a land where the extreme is common. Earthworms can grow to three feet and canaries can measure fifteen feet from peak to tail.

The equatorial rain-belt, which spans most of the middle of Africa, supports a large population of birds, both residents and migrants, some of which are truly rare and fascinating indeed. And you would be hard pressed to imagine creatures more diverse than the giraffe, (formerly known as the camel-leopard), the walking stick or the “spitting” cobra.



One of the pyramids of Giza, south of Cairo.

Ancient Egypt

There are two factors that enabled the ancient Egyptians to evolve a civilization that has been admired for millennia. One was of course the Nile, as noted so eloquently by **Herodotus**, known as the father of History. The other is what has been called its “splendid geographical location.” Protected from the north by the narrow coasts of the Mediterranean, from the south by several treacherous **cataracts** (rapids), and on either side by deserts that were as inhospitable then as now, Egypt was able to develop its own society on its own terms.

Early on, about 12,000 years ago, Egyptians saw the merits of an agrarian society that could get additional protein from fish, migrating birds and larger mammals. Later on, climate change may have played a role in driving people back to a hunting and

gathering lifestyle. Artifacts have been found that attest to this change. By about 5500 BC, the Egyptians were well established in permanent communities, domesticating animals and planting early varieties of barley and emmer.

Geological Change

160 million years ago, the continents drifted apart creating channels for the two mighty rivers of the Americas, the Amazon and the Mississippi, as well as a substantial trench for the longest



The expedition team floats through a portion of the Nile river.

river on earth—the Nile. In that era, the Nile emptied into the Indian Ocean. Millions of years passed and during that time massive changes took place. Seas, including the Mediterranean, were created, lakes were divided, mountains rose and were diminished. Following the last Ice Age, there was a rainy period in Africa that lasted some 6,000 years. Heavy rains falling on the Ethiopian highlands sent torrents of water rushing downstream, sweeping mud, silt, sand, gravel and even large rocks and boulders along its path. Over time, the water and stones scoured away at the earth creating a deep canyon and establishing a track for the river as it now raced along to the Mediterranean Sea. Then the rainy period ended and the land to the east and west of the Nile, particularly in Egypt, became a place, as some say, suitable only for scorpions and rattlesnakes.

But the Nile itself became a refuge for wildlife. Hunters and hunted were drawn, as if by a magnet, to the banks of the Nile to nourish themselves and pursue the business of living. Along the banks of the river, greater and lesser civilizations flourished and declined. Among the former was Pharaonic Egypt, living in a slice of time from about 3000 BC until 30 BC, when Egypt became part of the Roman Empire.

The Nile Cycle

For more than 5,000 years, the cycle of the Nile was unchanged. Each year a flood of water (the *inundation*) came cascading down the river bringing with it rich nutrients from the highlands of Ethiopia. In full flood, the muddy waters overflowed the river banks and spread out to prepare the fields for planting. The ancient Egyptians did not know where the waters came from. Some said that they came from a bottomless water jar, hidden in a cavern beneath the mountains at Aswan, and released at the appropriate time by the god **Hapy**. Others credited Khnum, an ancient creator god who also lived in the



MEDITERRANEAN SEA

ALEXANDRIA

GIZA CAIRO

EGYPT

**KARNAK
LUXOR**

ASWAN

ABU SIMBEL LAKE NASSER

RED SEA

SUDAN

KHARTOUM

ETHIOPIA

LAKE TANA

TISSISAT FALLS

BLUE NILE

WHITE NILE

vicinity of the First Cataract. Still other rituals honoured Osiris who, according to tradition, was killed and cut into little pieces by Seth, his jealous brother. Isis, wife of Osiris, pieced him together and brought him back to life (symbolizing crop renewal). It was her tears of mourning that were said to raise the waters of the Nile.

The ancients had calculated when the waters would come. Priest-astronomers, watching and recording what happened in the skies, had noted that Sirius, the Dog star, would disappear each year for about 70 days, eclipsed by the sun. It would then re-appear and shortly thereafter the waters would begin to rise.



Luxor Temple

Watching with interest was the Pharaoh and his tax collectors. Under the Egyptian system, all land was owned by the Pharaoh and controlled by bureaucrats and temple priests. Peasants were taxed, not on how much they grew but on how much they should have grown. The **Nilometer** predicted that amount to some extent. Gauges located along the river recorded its height and, theoretically, the extent of the fields that would be covered by the inundation.

Fields that were always covered by the inundation were taxed at the highest rate, those that sometimes received the inundation were taxed at the middle rate, while those that never flooded and had to be watered by hand were taxed at the lowest rate. According to the tax collectors, it was a simple matter. Wait for the flood waters to subside, which took about 100 days, plant the seed, use the sharp hooves of sheep and goats to drive the seed into the muddy soil and then simply wait for the hot sun to do the rest. The grain was converted into bread and beer. For most of its history, Egypt produced enough grain to feed its own people and to export a large surplus.

The difference between not having enough water and having too much was about six steps on the Nilometer, so the gauge was watched very carefully. The Nilometer was the instrument that, in the short term at least, forecast how the Nation would fare next season.

Controlling the Nile

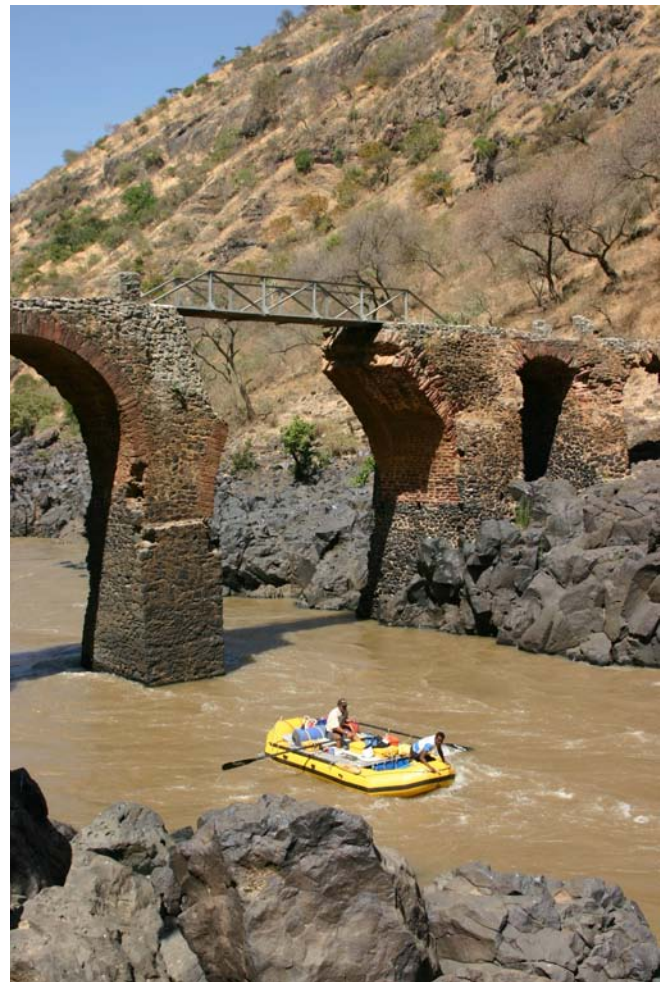
The first dam that was built on the Nile River was constructed around 2900 BC, in the Archaic Period, to protect the capital of Lower Egypt (known as Memphis, at the time) from flooding. The timing of the annual flood was fairly predictable. Records kept on behalf of the Pharaoh confirm that the floods arrived in Egypt sometime after the middle of May and before the end of June. It was a predictable cycle and capitol works projects, such as the construction of a pyramid, could be confidently scheduled. What was uncertain however, even into modern times, was the extent of the flood. Everyone from Egyptian priests to British hydrologists tried to find a means to predict the

level of flood waters—without success. Yet the stability and economic prospects of the Egyptian state relied on that.

When too much of an inundation occurred, the waters invaded homes and temples, dissolving the mud bricks used for construction and generally disrupting life. Yet even that was preferable to the spectre of a low flood or, worse still, a series of such events. Several low floods in a row meant that dust and famine would stalk the land.

The Nile as a means of transportation

The Nile River is a natural “highway” that runs from one side of Egypt to the other. For more than 5,000 years, it was the principal means of communication and transportation. It linked Upper and Lower Egypt: vast areas of desert on either side only increased its importance. On its waters, a variety of boats carried trade goods, building materials, collectors of tax and tribute, peasants, priests with sacred effigies, merchants and military might. South of Egypt, upstream, the Nile was historically less helpful in transportation due to cataracts or rapids, steep canyon walls, the turbulent Blue Nile and the vast extent of the swamp called the **Sudd**.



An expedition raft heads through territory few outsiders have ever seen.

Rivers

If you were to look at Planet Earth from space you would notice that a network of rivers encircles the globe, following much the same pattern as the human circulatory system. Various tributaries feed the major rivers of the world, including the Nile, and smaller

rivers and streams, in turn, nourish these. Collectively, their “job” is to transport fresh water to the ocean. And some are pretty good at it. When the Amazon reaches the Atlantic Ocean, it is carrying close to 25% of all the water that flows in the world’s rivers. The Nile may indeed be longer but there is no argument about who is mightier.

Enroute to the sea, rivers serve a number of functions: providing water for a variety of purposes: drinking, bathing, washing dishes, irrigating crops; transporting people and goods; serving as state and national boundaries; creating hydro-electric power; offering opportunities for recreation, assisting in manufacturing; providing habitats for plants, fish, birds and other animals. In fact, when you stop to think about it, rivers and the water from rivers have a continuing impact on our lives.

Normally we take the river and the gifts that it brings for granted. It is only when something goes “wrong” that it grabs our attention. Flooding is one of those natural events that can wreak havoc in a short span of time damaging crops and buildings and snuffing out lives in a heartbeat. You have only to look in the newspapers or watch the news on television to find easily somewhere in the world where they temporarily have too much water (**flooding**) or too little (**drought**). The Yellow River in China flooded extensively in 1887 and again in 1938, causing approximately a million deaths each time. The death toll from the Yangtse has also been very high.



A young Amhara girl along the banks of the Blue Nile

Cultures Along the Nile

The continent of Africa, birthplace of humanity, is home to almost a billion people, speaking more than 2,000 languages and dialects, and living in more than 50 countries. The continent is immense and extremely diverse, supporting the greatest populations of wildlife anywhere on the planet. The range of environments run the gamut from rainforest to desert and the plant, animal and human adaptations to these environments are equally varied.

Along the length of the Nile from ancient times to today, humans have responded to the opportunities and challenges of living, in their own distinctive fashion. In the film, there is time enough to only catch some glimpses of this variation and to gain an appreciation for what is unseen. When you consider that the continental United States could fit comfortably into the footprint of the Sahara Desert, it gives one some sense of scale, and in that immensity there is a lot of scope for biodiversity. **Ten countries** share in the waters of the Nile basin yet each, over time, developed its own unique culture and outlook. In the Sudan alone, Africa’s largest country, 400 distinct languages emerged as well as characteristically different lifestyles. Life became a cultural smorgasbord.



Pasquale Scaturro meets indigenous people along the river.

The culture that is best known to the world is undeniably that of Egypt that has had a major impact on western civilization, influencing our art, architecture, religion, medicine and even fashion in enduring ways. Thanks to the gifts of the Nile, which practically demanded pursuit of an **agrarian** way of life, the ancients evolved a highly structured and disciplined society which led Egypt to peaks of human achievement often admired but seldom attained. Their existence was highly insular and they developed an **ethnocentric** outlook that led them to conclude that Egypt was the best of all possible worlds and that paradise was just a somewhat improved version of the things to which they had become accustomed.

Egypt was not the only country that had pharaohs and pyramids. Southward, up the Nile in what is now the modern nation of Sudan, a mighty civilization emerged. Between 725 BC and 300 AD the **kingdom of Kush** rose to its pinnacle and then subsided. Egypt and Nubia had long had a history of conflict exacerbated no doubt by the Egyptian tendency to look on Nubia as a private hunting preserve for human and animal game. In their writings, the Egyptians almost always spoke of their neighbors in pejorative terms and there is little doubt that many regarded Nubia as an inferior frontier that could be exploited for its gold, ivory and slaves. But between 747 BC and 656 BC five “Black Pharaohs” ruled over both Egypt and Nubia before being displaced by the Assyrians. In the film, you will see some of the Kushite pyramids, which, while more numerous than the Egyptian ones, were significantly smaller and had a much steeper angle of inclination.

The relationship between Egypt and Ethiopia was somewhat more civil if only because of the distance separating both countries. Ethiopia’s high mountain ranges kept it as effectively isolated as Egypt’s deserts. But that didn’t stop the two of them from quarrelling with each other. It must be remembered that 85% of the Nile water reaching Egypt comes, with its rich nutrients, from Ethiopia. The ancient fear that Ethiopia could suddenly turn off that tap nurtured Egyptian paranoia and led directly to the construction of the Aswan Dam. Ethiopia has been a stronghold of Christianity for almost two millennia while most of Egypt is Moslem. But religion has not been as divisive a force as debates on the future of the Nile—debates guaranteed to grow more heated as population pressures increase and water for all becomes an elusive objective.

Experience Exploration

SKILLS USED IN THESE ACTIVITIES:

Research, creative writing, analysis

KEY WORD:

Source: the place where a river begins to flow, the beginning of a river.

BACKGROUND:

For more than two millennia, people have been searching for the source of the Nile. Some of those who tried include:

Herodotus, the world's first historian

Nero, the Roman Emperor

Ptolemy, the Greek astronomer/geographer

James Bruce, the Scottish explorer

John Speke, the Englishman

Padre Paez, Spanish priest

Adolf Linent, the Belgian

Sir Samuel Baker, English explorer

Burkhardt Waldecker, German explorer

Some were more successful than others.

The secret of the beginning of the Nile remained an elusive mystery for many centuries. Many early explorers thought they had found the answer to the mystery of the Nile only to be proved wrong, sometimes centuries later. Then, a bit more than a century ago, it was discovered that the Nile originated from two sources. The source of the White Nile is Lake Victoria; the major source of the Blue Nile is Lake Tana. Both of these natural reservoirs are fed by tiny springs and rainfall.



The very beginning of the Little Blue Nile is a muddy stream. It starts at the Springs of Gish Abay at Sakala Springs and reaches to Lake Tana.

TEAM ACTIVITY:

An Explorer's Life

TO DO:

There are nine explorers' names listed on the left and provided on the "copy page" for you to print and clip. Make copies of the "copy page" providing enough duplicates so that every student will have a name slip. Place the name slips into a hat, then have students draw name slips to select their explorer. Those who have selected the same name will work together as a team and use the library, the internet, or other resources to answer the following questions:

1. Where did each explorer come from?
2. When did he start his search?
3. What was his answer to the mystery?
4. On a scale of 1-5, how would you rate his success? (1 = very successful; 5 = unsuccessful)

Find a photograph or illustration of the explorer and biographical information and prepare a written presentation of your findings to present to the class. In your presentation, make sure you address the issue of what it was that motivated that particular explorer. In addition, list three desirable qualities of an explorer and two qualities that might make the choice of an explorer's life a poor selection as a career.

INDIVIDUAL ACTIVITY:

Preparing for the Journey

TO DO:

Place all the name slips back into the hat and add three more explorers: Mungo Park, Captain Richard Burton and David Livingstone. Then have students draw name slips.

1. Select an explorer and outfit the explorer for the trip. List all the equipment available at that time the explorer might reasonably take with him. After completing the first list, another comparative list should be made listing what the explorer would take if he were to go on the same trip today. Be prepared to defend your selections.
2. One of the most interesting sources of information comes from the journals of explorers. Your mission is to write just one page of such a journal from the viewpoint of your selected explorer. Imagine yourself in their shoes. Describe what they ate, where and how they traveled, what they saw that they found interesting, the dangers, discomforts, joys, etc. Make it so interesting that people will want to read it in a hundred years!

COPY PAGE

FOR TEAM ACTIVITY: AN EXPLORER'S LIFE

HERODOTUS

NERO

PTOLEMY

JAMES BRUCE

JOHN SPEKE

PADRE PAEZ

ADOLF LINENT

SIR SAMUEL BAKER

**BURKHARDT
WALDECKER**

ADDITIONAL NAMES FOR INDIVIDUAL ACTIVITY: PREPARING FOR THE JOURNEY

MUNGO PARK

DAVID LIVINGSTONE

**CAPTAIN RICHARD
BURTON**

The Aswan Choice

SKILLS USED IN THIS ACTIVITY:

Critical thinking, decision-making skills, creative writing skills

KEY WORD:

Inundation—The name historically given to the annual Nile flood, prior to the Aswan Dam.

BACKGROUND:

The Aswan Dam, opened in 1971, was an attempt to eliminate the unpredictable nature of the annual Nile flood and to exert some control over upstream states that historically had threatened, “to turn the taps off.” When water levels are low, the dam releases more water downstream. When water levels are high, more of the water is held back until it is needed. Behind the dam is a huge reservoir—the largest artificial lake in the world. Called Lake Nasser on the Egyptian side and Lake Nubia in the Sudan, it is capable of holding two full years of Nile flows. The lake is more than 500 feet deep, eight miles wide and more than 300 miles long. The Aswan Dam has changed the nature of a river that had worked, imperfectly sometimes, for more than 5,000 years. In the film the expedition team struggled against the darkness, wind and waves to cross this huge, man-made reservoir.

There were many reasons for building the Aswan Dam—to control flooding; to generate hydroelectric power; to attack unemployment and social unrest by providing work on a major capital project; to improve

political popularity and foster national pride. Similar reasons drive all kinds of major dams around the world. In doing so, the dam-builders try to calculate the impact that the dam will have on the lives of citizens and the well being of the state. But something else called “the law of unintended consequences” comes into play and effects that were underestimated or unimagined can happen with devastating consequences.

In this case, the dam filters out Ethiopian silt which contains a blend of nitrogen, phosphorus anhydrides and potassium, on which plants thrive. Now farmers must use chemical fertilizers which are more expensive and which add to pollution. The diminished flow of the Nile has allowed the waters of the Mediterranean to backwash up the Nile. The salt content disrupts plant and animal habitats and sterilizes the soil. In the northern Delta region the banks are now badly eroded. But, at least, the droughts and floods are avoided.

TO DO:

Consider all of the impacts of the Aswan Dam and list them in three columns—Positive, Undecided, and Negative Outcomes. Review the list and try to decide which column carries the most overall weight. Are there any “dealbreakers”—items that are non-negotiably unacceptable? Do the positive outcomes favor one group of people over another?

To get you started here are some topics: sardine fisheries, kingfisher populations, Nubian displacement, loss of valuable artifacts and prehistory, weight of Lake Nasser on earthquake fault, impact on Aswan regional temperatures, impact on evaporation, the Nile perch.



From the air, it is easy to forget that the Blue Nile is the most dangerous river in Africa.

Do We Want a Dam?

SKILLS USED IN THIS ACTIVITY:

Researching, charting and comparing, analyzing, and making predictions, critical thinking, decision-making skills, creative writing skills, argument and analysis

KEY WORD:

Dam—a barrier built to hold back flowing water

BACKGROUND:

The Aswan Dam project was the biggest feat of its day and compared in scale and audacity to the Great Pyramid project several millennia earlier. Now, there are thousands of dams in the world, most of which have been constructed in the last fifty years. There are about 50,000 major dams in the United States.

Approximately 50 million people around the world have been displaced from their lands by dam building. It is hard for us to imagine this kind of impact on a world basis. The biggest impact has often been on indigenous people. In order to create the reservoir now called Lake Nasser by the Egyptians and Lake Nubia by the Sudanese, it was necessary to re-locate 100,000 people and to submerge 5,000 years of history.

Removing and recovering what was deemed to be the better and more important archaeological treasures was expensive but comparatively easier than dealing with the human impact. Nations banded together

to rescue the artifacts, some of which were salvaged and repositioned in spectacular fashion, notably the superb temple at Abu Simbel, built by Ramses, the Great. The Nubian people, descendants of the Black Pharaohs of Kush, were re-located to an environment they considered to be totally alien.

Currently, construction of the largest dam of all—the Three Gorges Dam—is well underway in China. It has been estimated that the reservoir for the dam will submerge 137 cities and towns as well as 1,100 villages displacing 1.2 million people. Some environmental activists are concerned about its potential impact.

TO DO:

“Those who do not learn from the past are doomed to repeat it.” —GEORGE SANTAYANA, 20th century philosopher

Given what we have learned from the experiences with the Aswan Dam, what do you predict will happen with the Three Gorges Dam in China?

Copy the chart below. Using various references and sources, complete the table that compares three dams: the one that is nearest to your school, Aswan and Three Gorges. Encyclopedias and the Internet have useful information to help you complete your table. Search by using terms such as “world dams,” “dam sizes,” or “dam comparisons.” Also, if you search under the name of the dam, like “Aswan” or “Three Gorges,” you will easily locate a flood of information. Using the information you have collected, write a statement that describes the various possible outcomes of the Three Gorges Dam project.

DAM NAME		ASWAN	THREE GORGES
TYPE OF DAM			
PURPOSE			
STORAGE CAPACITY			
HYDROELECTRIC POWER			
COMPLETION DATE			
COMMENTS			

Target Tourism

SKILLS USED IN THESE ACTIVITY:

research, analytical skills, decision-making, marketing

BACKGROUND:

Tourism is now a major economic force in many countries. It is also an activity in which most students will likely be participating over the course of their lifetimes. This activity will allow students to gain insight into some aspects of international tourism and to appreciate some of its problems and complexities.

TO DO:

Students will gather information from a variety of sources on tourism and will use that information to develop an approach to responsible tourism along the Nile. Divide class up into project teams with 5-6 players per team.

Pose this situation to students: It is 2007. For the past several years, tourist traffic has been declining along the Nile and some governments are concerned. They rely on tourism to bring money into their local economies and to create jobs. Now several of these governments have banded together and have agreed to finance a campaign to promote tourism. After a great deal of discussion, your class has been selected to make a presentation to these governments telling them how you would go about tackling the problem. Your team does not have to produce finished marketing materials, such as television ads and posters, although you may want to sketch out a rough sample or two. What the governments are most interested in hearing about is what you think of this issue and how you think it might be addressed. Here are some things to think and talk about:

1. Is a decline in tourism necessarily a bad thing?
2. What kind of tourists would you recommend attracting? (eco-tourists, wealthy retirees, family groups, students)
3. What kind of benefits would each bring?
4. What kinds of services would each require? (transportation, accommodation, medical services, translators/guides)
5. What aspects would you want to promote? (ancient civilizations, festivals, unique wildlife, unusual vistas, cultural diversity)
6. What “downsides” of tourism can you see and how can these be minimized?



The team skims across the Nile river in Aswan, Egypt, amid feluccas.

7. How would you deal with languages, safety, security, major illness and so on?
8. How will you reach the people you want to reach?

Each team should begin with a general discussion, identifying 4-5 major issues that need careful examination before any plan can be put into effect. Each team is to identify one “deliverable,” one aspect on which the group will work to develop a presentation to the “governments” (teacher & classmates) showing how they would tackle that one deliverable.

A “deliverable” is the end product that the team feels should be produced as an element in a tourism campaign. It can be as simple as a travel poster or a set of television “spots.” It can be an advertising campaign aimed at Senior Citizens or Teachers; a contest to attract student activists interested in a travel/work assignment during the summer; a promotional campaign for the Internet or a strategic campaign to convert public attitudes towards tourism or environmental protection. One team might deal only with the aspect of transportation, another with safety and security, another with the promotion of wildlife.

EXTENSION QUESTIONS:

1. Is there a tourism promotion campaign for your region?
2. What are the key messages and the key visuals associated with the campaign?
3. To whom are the ads directed?
4. If you don't think the approach is perfect, how would you make it better?

Rolling on the River

Do the Math

SKILLS USED IN THIS ACTIVITY:

math skills

KEY WORDS:

Source—the place where a river begins to flow, the beginning of a river.

Average Mean Flow—the flow of water, usually measured in cubic meters, which discharges annually from the mouth of a river.

Discharge—the volume of water produced by rivers each year.

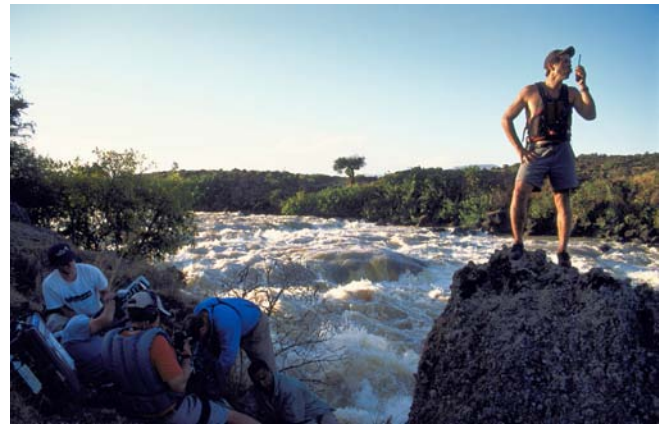


After four grueling months and over 3,000 miles, Pasquale Scaturro and Gordon Brown near the Mediterranean.

BACKGROUND:

The Nile is the world’s longest river and one of the eight major river systems spanning the continent of Africa. From its furthest source in Burundi, it stretches 4,132 miles (6,650 km) from the little spring at Kikizi to the Mediterranean Sea. In its upper reaches there are two Niles – the longer and more placid White Nile and the rambunctious Blue Nile, whose tiny source is the Sakala Springs in the Ethiopian highlands. The waters of the Nile are so precious that both springs are considered to be sacred. The White and Blue Niles meet at Khartoum, the capitol of the Sudan, and combine their waters, which then flow into the sea.

The White Nile is the longest branch of the river, but it is the Blue Nile that supplies 80% to 85% of the water that eventually reaches Egypt. There are ten countries that make up the massive Nile River basin. These are: Burundi, Democratic Republic of Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania and Uganda. (see map on page 6)



Pasquale Scaturro scouts the river rapids and radios to the rest of the team.

Whenever lists are made of the Great Rivers of the world, the Nile is included and usually heads the list. The measure of a river’s greatness lies partially in its length, partially in its rate of flow but primarily in the impact that it has on the people and environment it nourishes. No river has had greater influence for so long.

RIVER	LENGTH, KILOMETERS	LENGTH, MILES
Nile	6,650	4,132
Amazon	6,437	4,000
Yangtze	6,380	3,915
Mekong	4,345	2,700
Mississippi	3,765	2,340
Rio Grande	3,058	1,900

TO DO:

Imagine your job is to fill an artificial lake using the annual discharge from a river. Assuming that your lake will hold 200 billion cubic meters of water, approximately how much faster can you fill the lake using the Amazon’s discharge rather than that of the Nile? Hint: You conquer by dividing. (Answer page 17)

RIVER	AVERAGE DISCHARGE, CUBIC FEET PER SECOND
Amazon	4,200,000
Yangtze	1,236,000
Mississippi	651,000
Nile	122,620
Mekong	28,000
Rio Grande	3,000

Hieroglyph Holiday

BACKGROUND:


It was the Greek historian Herodotus who first told us about the sacred writings of the ancient Egyptians. Hieroglyphics is made up from two Greek words—*Hieros* meaning “sacred” and *gluptien* meaning “carvings.” The Egyptians themselves called this writing *medou neter*, which means “words of the gods,” and they believed that this precious gift came to them through Thoth, their god of wisdom. It was sacred because of its origins but was also most often used in sacred settings such as tombs and temples.

At the time of Herodotus there were perhaps 6,000 different hieroglyphic symbols in use, most known only to priests and other highly-educated people. Only about 1% of Egyptians could read this writing but they respected those that could. Most hieroglyphic writing on temple walls and accompanying public monuments make use of only 150-200 symbols, so learning to read some of the writing is both possible and enjoyable, as many tourists have found.

Roman emperors, converted to Christianity, banned the use of “pagan” hieroglyphics in the fourth century, A.D. Gradually people forgot how to read or write it. Then one of Napoleon’s soldiers found a black stone near Rosetta, Egypt, with three kinds of writing on it. One was Egyptian hieroglyphics. Soon the world learned again how to read this mysterious writing.

TO DO:

Make photocopies of the Hieroglyph Alphabet Chart and distribute to each student. Have students spell their name with hieroglyphs by drawing the symbols by hand or using a hieroglyph rubber stamp set. Because some glyphs represent more than one sound, student’s answers may have alternate readings. Also, you could post phrases or sentences written in the hieroglyph alphabet and have students decipher them.



The usual way of writing hieroglyphics is from right to left (as above) but they may also be written from left to right or even top to bottom. The animals and humans face in the direction from which the writing is meant to be read.

TAKING IT FURTHER:

The class could paint or create a mural of an Egyptian or Nile scene and add hieroglyphs to the scene. The art could be displayed in an outdoor area of the school.

HIEROGLYPH	REPRESENTS	LETTER / SOUND
	vulture	short A, as in asp
	forearm	long A, as in table
	leg	hard B, as in barge
	basket	hard C (K), as in cat
	hobble rope	CH, as in children
	hand	hard D, as in dog
	two reed leaves	long E, as in reed
	vulture	short E, as in set
	horned viper	F, as in furniture
	pot stand	hard G, as in gold
	cobra	soft G, as in generous
	shelter, rope	aspirated H, as in heart
	reed leaf	short & long I, as in him, sigh
	cobra	J, as in jelly
	basket, hillside	hard C or K, as in kind, lack
	mouth	L, as in lip
	owl	M, as in milk
	water	N, as in Nile
	quail chick	long O, as in moon
	vulture	short O, as in hot
	stool	P, as in panther
	horned viper	PH, as in pharaoh
	basket + quail	Q, as in queen
	mouth	R, as in red
	folded linen	S (soft C), as in sane, peace
	lake	SH, as in shadow
	loaf of bread	T, as in talk
	cow belly	soft TH, as in mother
	quail chick	short U, as in lull
	reed + quail	long U, as in ruler
	horned viper	V, as in viper
	quail chick	W, as in willow
	basket + linen	X, as in fox
	reed leaf	short Y, as in yellow
	two reed leaves	long Y, as in tardy
	door bolt	Z, as in zany

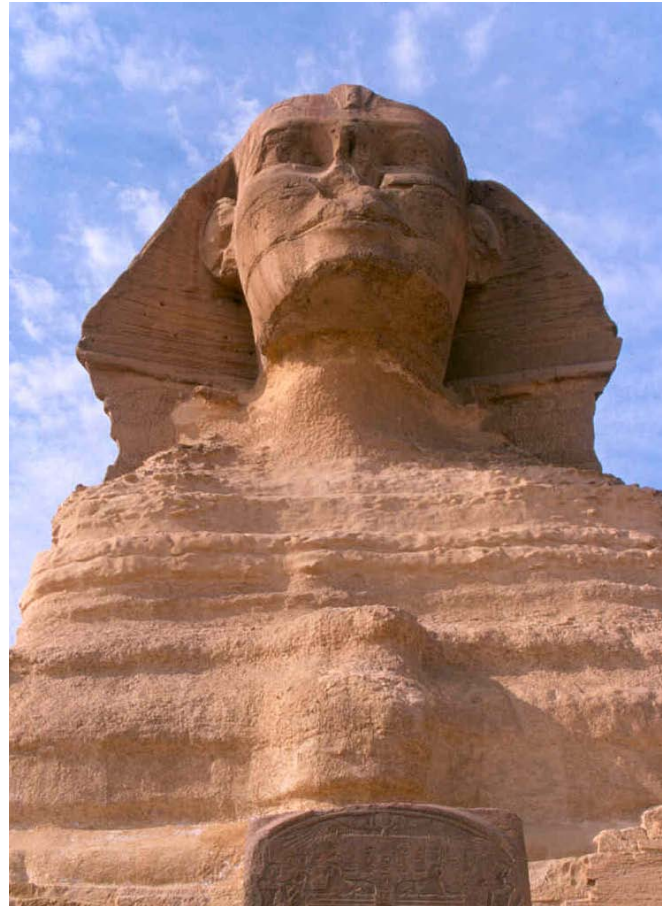
Word Pyramid

TO DO

Try to find Nile-related words in the Word Pyramid. When you find a word, circle it. Words may be found horizontally, vertically or diagonally. (Answers page 17)

ACTIVITY EXTENSION:

Create a Word Find using hieroglyphs!



The Sphinx, whose name means "living image," was considered the guardian of the necropolis of Giza.

WORD PYRAMID CLUES

1. A bird which was the symbol of the Egyptian god of wisdom.
2. This animal's eyes and nostrils are on top of his head.
3. The Aswan Dam has made it easier for this bird to find its food.
4. Ancient Egyptian god with the head of a crocodile.

5. For thousands of years, houses along the Nile have been built from this.
6. Writing "paper" of the ancient scribes.
7. Also known as a Dung Beetle.
8. Ancient Egyptian symbol of life.
9. Plant-eating water mammal with an unpredictable disposition.

T

A S

C N R S

O R K W A P

P L N H C R V A

E S T S S O B E K B

R S H I P P O H Y O M Y

A N I L E M U D E R S T H I

P A P Y R U S B I B I S L U S K

A K I N G F I S H E R M A S T Y L V

A C R O C O D I L E V B X S C A R A B I

FAST FACTS

Fast facts on the Nile crocodile, the camel and the hippo are provided. Teachers may create a photo display that invites students to identify facts about the animals that appear in the film. Or a handout could be produced for students to answer “True” or “False” responses to each fact.

NILE CROCODILE FAST FACTS

- The Nile crocodile is found in hot, steamy areas of Africa and spends the majority of its days basking along riverbanks with its mouth wide open. Mouth gaping is similar to the panting of a dog; it helps a hot croc cool off. It is also considered an invitation to the Egyptian plover, or crocodile bird, to clean the croc’s teeth.
- The average life span of a croc in the wild is about 45 years and may live up to 80 years in captivity.
- Adults of both sexes may easily exceed 500 pounds and average about 16 feet with a maximum size of about 20 feet. 15 feet long mummified crocodiles have been found in Egypt.
- The Nile croc has 66 sharp teeth that make them a top predator in the food chain, help them scavenge, and help them to eat barbell catfish.
- Up to 70% of the adult diet is fish. They also prey on zebras, hippos, porcupines, pangolins, and migrating wildebeest.
- They are the most aggressive crocodile and can swim 12 miles-per-hour. Both crocodiles and hippos can outrun humans for short distances.
- When fish are migrating, crocs may hunt cooperatively by forming a semi-circle across the river and herding the fish. They then eat the fish that are closest to them.
- A female can lay 25-100 eggs on sandy shorelines, dry streambeds, or riverbanks. She then covers the eggs with sand and guards them until they hatch 3 months later.
- When young crocodiles are hatching, either parent may help them out of the egg by rolling it between their tongue and palate. This cracks the shell allowing for an easier escape.
- If baby crocodiles are in danger, the adult female may pick them up and flip them into her mouth or gular (throat) pouch for protection.
- There are few predators willing to tackle an adult Nile croc other than another croc or people. People have over-hunted them for their meat, skins, and other body parts.

CAMEL FAST FACTS

- 🐪 A single calf is born after a gestation period of 13 months and can move freely by the end of the first day. Life span is about 30-40 years.
- 🐪 The average head and body length of a camel is 10 feet, shoulder height of 6-7 feet and can weigh up to 1,500 pounds.
- 🐪 Camels’ feet are broadened to make it easier to walk on sand. The long eyelashes protect the eyes from wind-blown sand. The nostrils can close to keep sand out. Lips are thickened to withstand the coarsest of desert plants.
- 🐪 The camel’s hump is stores fat, not water. It is flesh and is not supported by bones. Baby camels are born without a hump because the layer of fat does not develop until they eat solid food.
- 🐪 The heavy fur and fatty hump help to insulate the body and prevent the body temperature from rising to a sweating point.
- 🐪 The male camel protrudes a fleshy fold from his mouth and lets out a very loud unpleasant roar when calling for a mate.
- 🐪 Camels are able to eat practically anything that grows in the desert. Camels will eat fish, meat, bones and even skin.
- 🐪 Camels are able to drink brackish or salt water and have been known to drink one third of their body weight in ten minutes.
- 🐪 Camels can survive a 40% loss of body weight without serious consequences.

HIPPOTAMUS FAST FACTS

- 🐘 The name hippopotamus means “river horse,” although they are more closely related to the whale than to the horse.
- 🐘 Distantly related to the pig, the Nile hippopotamus is a hoofed vegetarian that feeds on grass, fallen fruit, and cultivated crops such as sugar cane or corn.
- 🐘 Nile hippopotamuses inhabit river areas with deep water and adjacent reed beds and grasslands of Africa, south of the Sahara and along the Nile. The hippo is the third largest mammal in Africa.
- 🐘 Hippos are born in the water and can weigh as much as 100 pounds. The calves can swim at birth.
- 🐘 Hippos can grow to be 14 feet long and can weigh almost four tons.
- 🐘 Hippos can’t sweat, so staying in the water helps them to keep cool.
- 🐘 Although hippos can swim with the help of their webbed feet, they also spend much of their time actually walking on river or lake bottoms.
- 🐘 An adult hippo can stay submerged for as long as five minutes.
- 🐘 On land, hippos may seem clumsy but they can run very fast, likely faster than you!
- 🐘 The hippo is the only land mammal that can open its mouth a full 180 degrees. This gives the hippo the second largest mouth of any creature on earth. Only whales have bigger mouths.
- 🐘 When hippos open their mouths wide, it is not a yawn, but is actually a threat gesture.
- 🐘 Fish sometimes graze on algae growing on the hippo’s skin. Turtles and young crocodiles bask on their backs. Birds, including cattle egrets and storks, use them as a perch for fishing.
- 🐘 Hippos have a cattle-like bellow used as a threat. They make a horse-like neighing sound when alarmed.

GLOSSARY

- Average Annual Mean Flow**—The flow of water, usually measured in cubic meters, which discharges annually from the mouth of a river
- Cataract**—An area of steep rapids in a river—the Nile has many cataracts
- Channel**—The shallow trench or bed in which a river or brook runs
- Culture**—The customary learned beliefs, forms and behaviors of a society including such things as art, music, food and rituals
- Drought**—A sustained and extensive period of dryness well below the regional average. This is usually a temporary feature caused by fluctuations in the climate cycle
- Ethnocentric**—The belief that your own cultural group is superior to others
- Inundation**—The name historically given to the annual Nile flood, prior to the Aswan Dam
- Hapy**—God of the inundation (flood)
- Khnum**—Creator god and god of the 1st Cataract
- Osiris**—God of the underworld, symbol of regeneration
- Ten countries of the Nile**—Burundi, Democratic Republic of the Congo, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Sudan, Tanzania, Uganda
- Agararian**—Farming
- Kingdom of Kush**—Part of Nubia, which is now part of the Republic of Sudan

ANSWER KEY:

Rolling On The River—Do The Math, page 14
 $5518 \div 88 = 62.7$ The answer is approximately 60 times faster.

Word Pyramid, page 16

- | | | |
|---------------|---|--------------|
| 1. Ibis | T | 5. Nile mud |
| 2. Hippo | A S | 6. Papyrus |
| 3. Kingfisher | C N R S | 7. Scarab |
| 4. Sobek | O R K W A P | 8. Ankh |
| | P L N H C R V A | 9. Crocodile |
| | E S T S (S O B E K) B | |
| | R S (H I P P O) H Y O M Y | |
| | A (N I L E M U D) E R S T H I | |
| | (P A P Y R U S) B (I B I S) L U S K | |
| | A (K I N G F I S H E R) M A S T Y L V | |
| | A (C R O C O D I L E) V B X (S C A R A B) I | |

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Reading Recommendations for Younger Readers:

- A Primer on Water*, Environment Canada, Ottawa. 1991.
- Earthscape Editions*, Knapp, Brian. River, Grolier. 1992.
- Water Energy*, Rickard, Graham, Gareth Stevens Books. Milwaukee. 1991

Websites:

- The following are some sites you might want to check out:
- Information on the film *MYSTERY OF THE NILE*:
<http://www.nilefilm.com>
- Wonders of the World, databank on dams, vital stats, dam comparisons:
<http://www.pbs.org/wgbh/buildingbig/wonder/structure/browse.html>
- Nile online safari:
<http://interoz.com/egypt/wildegypt/nile3.htm>
- Africa Information Center:
<http://www.hmnet.com/africa/1africa.html>
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