Easton Royal Academy: Science Curriculum

Seasonal changes	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Cycle A (C)	Soil to Sea	Materials & Water	Animal Exhibits		Tremendous Trees	
Cycle B (D)	Little Pig Rescue		Our Bodies & Senses		Perfect Plants	
Year A	Earth & Space	Peak Performance	Exhibition of Curiosities	Crime Lab Investigation	Base Camp Investigation	
Year B	The Lives of Raptors	Mission Force	Science fair: digestive system	Short Circuit	Water Voles	How do flowering plants work?
Year C	Personal Trainer	Science Fair: States of Matter	Animate: circulation	A Shady Performance	Music Festival Materials	A Game of Survival

Year D	Science fair: Marvellous Magnets	Fabulous Fungi	Inner Space	Project Security	The Sound Show
					

Progression of disciplinary knowledge

Working Scientifically			
	KS1	**LKS2**	**UKS2**
Asking Questions	• Asking simple questions and recognising they can be answered in different ways	• Asking relevant questions and using different types of scientific enquiries to answer them	• Asking more detailed questions and suggesting ways these might be investigated through different types of enquiry.
Using Evidence	• Asking and discussing with their teachers the answers to 'how do we know this is true?'.	• Using straightforward scientific evidence to answer questions or to support their findings.	• Identifying scientific evidence that has been used to support or refute ideas or arguments.
Observing and gathering data	• Observing closely, using simple equipment. • Attention to detail increasing over KS1. • Range of 'noticing' increasing over KS1. • Understanding the purpose of different pieces of scientific equipment.	• Making systematic and careful observations and, with support, taking accurate measurements using standard units. • With support, using a range of equipment, including thermometers and data loggers.	• Making systematic and careful observations and, with increasing independence and precision, taking accurate measurements using standard units, using a range of scientific equipment. • Year 5 and 6 children will take repeat readings, where appropriate, to increase accuracy. • Year 5 and 6 will have increasing independent control over scientific equipment.
Investigating	• Performing simple tests.	• Setting up simple practical enquiries, comparative and fair tests. • Year 3 and 4 children will set up simple tests independently and will participate in more complex investigations with support.	• Children in years 5 and 6 will design their own investigations, including recognising and controlling variables where necessary and increasing the number or complexity of variables.
Identifying and classifying	• Identify and classify using supporting resources.	• Identifying differences, similarities or changes related to simple scientific ideas and processes.	
Recording data	• Gathering and recording data to help in answering questions. • Accuracy of scientific drawing increasing over KS1. • Number and detail of labels increasing over KS1.	• Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. • LKS2 drawings are careful and accurate and are accompanied by explanation.	• Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar and line graphs. • UKS2 drawings are detailed, accurate and designed to accompany explanations (e.g more than one angle or magnification may be included for clarity). • UKS2 graphs and charts will be able to cope with increasing complex data.
Using data	• Using their observations and ideas to suggest answers to questions	• Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.	• Using test results to make predictions to set up further comparative and fair tests.
Reporting and presenting data		• Present data in a variety of ways to answer questions. • Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	• Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.
Vocabulary	• Reading and spelling scientific vocabulary at a level consistent with their increasing word and spelling knowledge at KS1.	• Reading and spelling scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge.	• Reading, spelling and pronouncing scientific vocabulary correctly.

Plants

KS1 *Year one should master the black objectives and be introduced to the green.* *Year two should master all black and green objectives.*		**KS2** *All KS2 children should master all objectives and will do so with different degrees of independence, using increasingly complex investigations, data, explanations and vocabulary.*
Year A	**Year B**	**Year B**
Tremendous Trees - Which of our trees are native to the UK and how do vegetables grow?	**Perfect Plants - Which of our trees are not native to the UK and how do garden flowers grow?**	**How do flowering plants work?**
• Identify and name a variety of common trees native to the UK (including deciduous and evergreen) , wild flowers and vegetable plants. • Identify and describe the basic structure of a tree (roots, trunk, branches, leaves, buds/flowers/fruit) • Observe and describe the growth of courgette seeds into mature plants with fruit by growing, harvesting and eating their own courgettes. • Find out and describe how plants need water, light, nutrients and a suitable temperature to grow and stay healthy.	• Identify and name a variety of common trees non-native to the UK (including deciduous and evergreen) , weeds and garden flowers. • Identify and describe the basic structure of a garden flower (roots, stem, leaves, flower). • Observe and describe the growth of nasturtium seeds into mature plants with flowers by growing, harvesting and arranging their own flowers. • Find out and describe how plants need water, light, nutrients and a suitable temperature to grow and stay healthy.	• Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. • Explore the requirements of plants for life & growth (air, light, water, nutrients from soil & room to grow) & how they vary from plant to plant. • Investigate the way in which water is transported within plants. • Explore the part that flowers play in the life cycle of a flowering plant, including pollination, seed formation and seed dispersal.
Key enquiries: • Use SeeSaw to photograph and label native trees in the local environment. • Collect wild flowers on a sticky card and label. • Grow seeds in bags in different conditions and draw and label it as it progresses (a seed diary). • Grow courgettes in the school veg garden and keep an account of their progress. • Draw and label plant diagrams in books.	**Key enquiries::** • Photograph and label of non-native trees in the local environment. In books or on SeeSaw. • Drawings of collected weeds and writing or recording on SeeSaw of their characteristics (eg 'sticky weed')– why don't gardeners like them? • Grow nasturtiums from seed. Keep a drawing diary to show progress. • Grow cress (and attempt to grow cress in a cupboard). Write about what happened and why.	**Key enquiries:** • Plant beans in transparent jars. Set up and run an investigation to investigate conditions (LKS2 to look at position of light and water, UKS2 to add more variables linked to nutrients, where appropriate). • Measure plant height, water and light levels using data loggers and other equipment (different degrees of independence across the key stage). • Labelled sketches of different parts of plants in book. • Classification grids in books, classifying different foods as either root, stem/shoot, leaf, flower, fruit or seed. • Food colouring investigation and how water travels inside Plants – what happened and why?
Additional enrichment activities and resources:	**Additional enrichment activities and resources:**	**Additional enrichment activities and resources:**

• Children will walk to the woods as part of forest school and identify trees and wild flowers in situ. They will see first hand and describe the changes in trees and plants throughout the seasons. • Children will grow their own courgettes in the school vegetable garden and will use them to cook and eat their own dish.	• Children will walk to the woods as part of forest school and identify trees and wild flowers in situ. They will see first hand and describe the changes in trees and plants throughout the seasons. • Children will grow their own flowers in the school garden and will pick and arrange these as a gift for a loved one at home.	• https://www.rhs.org.uk/education-learning/gardening-children-schools • Visit Jones' Mill (Pewsey) and look at the range of plants in different areas (meadow, stream, water meadow and wood).

Animals, including humans

KS1 *All KS1 children should master all objectives and will do so with different degrees of independence, using increasingly complex investigations, data, explanations and vocabulary.*

KS2 *LKS2 should master the black objectives and be introduced to the green.* *UKS2 should master all black and green objectives.* All children will encounter each green objective in both lower and upper KS2 in different contexts.

Year A	Year B	Year A		Year B	Year C		Year D
Animal Exhibits	**Our Bodies & Senses**	**Peak Performance**	**Base Camp Investigation**	**Science fair: Digestive system**	**Training Advice**	**Animate Circulation**	**Inner Space**
Children work towards an exhibition of learning in the hall. They learn about some specific animals and compare features. For the exhibition, there are small groups of experts on diet, basic needs and habitat, structure & life cycle. Parents are invited and children talk and present.	**https://www.stem.org.uk/resources/collection/417763/flavour-sense** *Children investigate the connection between our senses and how we experience food. Children take measurements of parts of their bodies (head, feet, hands, arms etc). They present data and look for patterns (e.g foot and head size).*	*Children meet a sports team and spend the term preparing to advise them on a range of performance issues.*	*https://www.stem.org.uk/resources/elibrary/resource/315584/what-affects-your-heart-rate* *Children watch the videos on the link above. They design an investigation in small groups and collect data from each group and from the whole class. They use the data to write an advice guide for school athlete*	*Children are tasked with setting up a science fair in the hall for acorn class. Each stand will have practical things to do which teach the parts of the digestive system and acorn class will visit each stand in order.*	*Children become personal trainers and in groups they conduct research and investigations to support a given client with diet and exercise.* *They present their findings to the client at the end of the unit.*	*Children are tasked with creating an animation for the pupil page on our school website, which shows how the human circulatory system works.*	*Inspired by the PG film 'Inner space', children are tasked with writing a scientifically accurate fictional story about a crew who are shrunk and go through the human digestive system. They plan their story around the required scientific information for each stage of the journey.*
Key enquiries:	**Key enquiries:**	**Key enquiries:**	**Key enquiries:**	**Key enquiries:**	**Key enquiries:**	**Key enquiries:**	**Key enquiries:**

• For a variety of common animals, including fish, amphibians, reptiles, birds and mammals: - Identify and name them and their basic needs; - Know whether they are carnivores, herbivores or omnivores; - Describe and compare their structure - Notice they have offspring which grow into adults.	• Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. • Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. • Understand that exercise makes the heart work and that warming up before exercise is important	• Identify that animals, including humans, need the right types and amount of **nutrition**, and that they cannot make their own food; they get nutrition from what they eat. • Identify that humans and some animals have **skeletons and muscles** for support, protection and movement. • Recognise the **impact of diet, exercise, drugs and lifestyle** on the way their bodies function.	• Identify and name the main parts of the **human circulatory system**, • and describe the functions of the heart, blood vessels and blood.	• Identify the different types of **teeth** in humans and their simple functions. • Describe the simple functions of the basic parts of the **digestive system** in humans. • Describe the ways in which **nutrients** and water are transported within animals, including humans. • Describe the changes as humans develop from birth to old age.	• Identify that animals, including humans, need the right types and amount of **nutrition**, and that they cannot make their own food; they get nutrition from what they eat. • Identify that humans and some animals have **skeletons and muscles** for support, protection and movement. • Recognise the **impact of diet, exercise, drugs and lifestyle** on the way their bodies function.	• Identify and name the main parts of the **human circulatory system** • describe the functions of the heart, blood vessels and blood.	• Identify the different types of **teeth** in humans and their simple functions. • Describe the simple functions of the basic parts of the **digestive system** in humans. • Describe the ways in which **nutrients** and water are transported within animals, including humans. • Describe the changes as humans develop from birth to old age.

Living Things & Habitats

KS1 *All KS1 children should master all objectives and will do so with different degrees of independence, using increasingly complex investigations, data, explanations and vocabulary.*

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Year A	Year A	Year B	Year C
Soil to Sea	**Water Voles**	**The lives of Raptors**	**Fabulous Fungi**
Children learn about what makes a living thing. They look at the idea of basic needs and then look at a wide variety of animals and plants and their habitats. Finally they zone in on some investigations of worms in the science garden at school and of rock pools in a whole school trip to the coast.	*Children have a visit from ARK rivers, who bring river life into school for them to survey and study. Children classify river life. Children study the biggest threats to water voles. They write letters to support ARK with their campaigning. They create a whole-class presentation to parents about the plight of the water vole and what can be done to help.*	Children have been commissioned to plan and film a documentary about the lives of birds. They learn about some key birds, including a comparison of their life-cycles with the life-cycles of mammals, amphibians and insects. They visit the hawk conservancy and interview experts on birds as well as hearing about the threats to vultures.	Children work with UK mycologist (or watch his videos) NAME? They study and classify different types of fungi in the UK and look at the importance of fungi for other ecosystems. They look at the costs of the destruction of woodlands and the fact that these complex ecosystems are not quickly replaced by planting more trees.
• Explore and compare the differences between things that are **living, dead and things that have never been alive.** • Identify that most living things live in **habitats** to which they are suited and describe how different habitats provide for the basic needs of different	• Recognise that living things can be grouped in a variety of different ways. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • Describe how living things are **classified** into broad groups according to common observable	• Describe the differences in the **life cycles** of a mammal, an amphibian, an insect and a bird. • Describe the life process of **reproduction** in some plants and animals. • Recognise that **environments can change** and that this can sometimes pose dangers to living things.	• Recognise that living things can be grouped in a variety of different ways. • Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment. • Describe how living things are **classified** into broad groups according to common observable

kinds of animals and plants, and how they depend on each other. • **Identify and name a variety of plants and animals** in their habitats, including micro-habitats. • Describe **how animals obtain their food** from plants and other animals, using the idea of a simple **food chain**, and identify and name different sources of food.	characteristics and based on similarities and differences, including micro-organisms, plants and animals. • Give reasons for **classifying** plants and animals base don specific characteristics. • Recognise that **environments can change** and that this can sometimes pose dangers to living things. 		characteristics and based on similarities and differences, including micro-organisms, plants and animals. • Give reasons for **classifying** plants and animals base don specific characteristics. • Recognise that **environments can change** and that this can sometimes pose dangers to living things.

Everyday Materials

KS1 *Year 1 should master the black objectives and be introduced to the green.* *Year 2 should master all black and green objectives.* All children will encounter each green objective in both year 1 and 2 in different contexts.

Year A	Year B
Materials and Water	**Little Pig Rescue**
Children investigate a range of materials and their characteristics. Over the course of the unit, children look at the characteristics and uses of materials in the context of water by looking at roofing materials and setting up an investigation to see which type of material would be best used to fix an umbrella.	*Children are tasked with supporting the three little pigs to investigate materials in a more scientific way. What are straw and twigs useful for if not building houses? What are the characteristics of glass/plastic/wood and metal and therefore what would a glass/plastic/wooden/metal house be like? Have any such houses ever been built?*
• Distinguish between an **object and the material** from which it is made. • **Identify and name** a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • Describe the simple **physical properties** of a variety of everyday materials. • **Compare and group** together a variety of everyday materials on the basis of their simple physical properties. • Identify and **compare the suitability** of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	• Distinguish between an **object and the material** from which it is made. • **Identify and name** a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. • Describe the simple **physical properties** of a variety of everyday materials. • **Compare and group** together a variety of everyday materials on the basis of their simple physical properties. • Identify and **compare the suitability** of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Light

KS2 *LKS2 should master the black objectives and be introduced to the green.* *UKS2 should master all black and green objectives.* All children will encounter each green objective in both lower and upper KS2 in different contexts.

Year A	Year C
Crime Lab Investigation	**A Shady Performance**
https://www.hamilton-trust.org.uk/science/year-6-science/crime-lab-investigation/ *A crime has been committed and the UK crime lab needs a team to analyse its evidence against six suspects. They need a team with mathematical prowess and a scientific line of attack. Children form groups to tackle this mystery.*	*Children investigate light and shadow and create their own shadow puppet performance using coloured filters and different distances between light and objects to create colour, foreground and background in the performance. They use English lessons to write the script and stage directions.*
• Recognise that they need light in order to see things and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by a solid object. • Find patterns in the way that the size of shadows change. • Recognise that light appears to travel in straight lines. • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. • Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.	• Recognise that they need light in order to see things and that dark is the absence of light. • Notice that light is reflected from surfaces. • Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. • Recognise that shadows are formed when the light from a light source is blocked by a solid object. • Find patterns in the way that the size of shadows change. • Recognise that light appears to travel in straight lines. • Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. • Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. • Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.

Forces & Magnets

KS2 *LKS2 should master the black objectives and be introduced to the green.* *UKS2 should master all black and green objectives.* All children will encounter each green objective in both lower and upper KS2 in different contexts.

Year D	Year B
Science Fair: Marvellous Magnets	**Mission Force**
Children are tasked with planning and setting up a science fair in the hall for acorn class on magnets. The fair needs to include practical 'hand-on' activities led by children in Oaks and should also have eye-catching and informative visual displays. Children learn all about magnets first and then decide which are the key aspects they need to focus on in the Science fair.	https://www.hamilton-trust.org.uk/science/year-5-science/forces-may-forces-be-you *Children are part of the team of scientists from the Natural history museum who have been asked to retrieve a rare and valuable meteorite that has crash-landed on Earth. They first look at the gravity which pulled the meteorite to Earth and then they have to plan to parachute themselves to the site. When they arrive, they need to lift it out of a hole, but which mechanisms will be useful and why?*
• Notice that some forces need contact between two objects, but magnetic forces can act from a distance. • Observe how magnets attract or repel each other and attract some materials and not others. • Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. • Describe magnets as having two poles. • Predict whether two magnets will attract or repel each other, depending on which poles are facing.	• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. • Identify the effects of air resistance, water resistance and friction that act between moving surfaces. • Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. • Compare how things move differently on difference surfaces.

Electricity

KS2 *LKS2 should master the black objectives and be introduced to the green.* *UKS2 should master all black and green objectives.* All children will encounter each green objective in both lower and upper KS2 in different contexts.

Year B	Year D
Short Circuit	**Project Security**
Inspired by famous film robots such as Johnny 5 (Short Circuit) and Wall-E (Wall-E), children investigate circuits and then use their knowledge to design and build their own robot with working parts such as lights, spinning parts and buzzer buttons.	*Children use the knowledge and understanding they have built from their investigations of circuits to design a home/bedroom security device (e.g a touch-pad which sets of a buzzer, a trip switch connected to the door frame setting off a buzzer or flashing light etc).*
• Identify common appliances that run on electricity. • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. • Recognise some common conductors and insulators, and associate metals with being good conductors. • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • Compare and give reasons for variants in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. • Use recognised symbols when representing a simple circuit in a diagram.	• Identify common appliances that run on electricity. • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. • Recognise some common conductors and insulators, and associate metals with being good conductors. • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • Compare and give reasons for variants in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. • Use recognised symbols when representing a simple circuit in a diagram.

Evolution & Inheritance	Rocks & Fossils	Properties & changes of materials	States of Matter	Sound	Seasonal Changes	Earth & Space
KS2 – Year C	**KS2 – Year A**	**KS2 – Year C**	**KS2 – Year C**	**KS2 – Year D**	**KS2 – Year NA**	**KS2 – Year D**
A Game of Survival	**Exhibition of Curiosities**	**Music Festival Materials**	**Science Fair: States of Matter**	**The Sound Show**	**Seasonal changes**	**Earth & Space**
https://www.hamilton-trust.org.uk/science/year-6-science/game-survival/ *Can you succeed in the Game of Survival? Take part in a series of challenges and see if you can accrue enough points to make it onto the Game of Survival leaders' board. You will need to have your evolutionary wits about you and a keen eye for the survival of the fittest*	*Children read Stone Girl Bone Girl (Laurence Anholt) ans set about learning about rocks and fossils. They create their own exhibition of labelled curiosities for parents to come and view.*	*The annual Spring Music Festival launches in just over 2 months and children have been selected to form the 'materials committee'. Do they know their thermal insulators from their thermal conductors? Can they find the best materials for take-out bags and drinks bottles? They will need to carry out an impressive array of tests to identify which materials are up to the job for a variety of festival needs.*	*Children are tasked with setting up a science fair for acorn class to teach them about states of matter. The fair should have supervised stalls with a range of practical 'hands-on' activities as well as eye-catching and informative displays.*	*Children create an educational podcast for the school website to teach younger children about sound. They research and investigate it for themselves and then decide on the key pieces of information for the recording. They script and rehearse 'The Sound Show' in their English lessons.*	Covered out of Science lessons (daily weather record and forest school).	
• Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. • Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.	• Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. • Recognise that soils are made from rocks and organic matter. • Describe in simple terms how fossils are formed when things that have lived are trapped within rock. • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.	• Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets. • Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. • Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. • Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. • Demonstrate that dissolving, mixing and changes of state are reversible changes. • Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	• Compare and group materials together, according to whether they are solids, liquids or gases. • Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius. • Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	• Identify how sounds are made, associating some of them with something vibrating. • Recognise that vibrations from sounds travel through a medium to the ear. • Find patterns between the pitch of a sound and features of the object that produced it. • Find patterns between the volume of a sound and the strength of the vibrations that produced it. • Recognise that sounds get fainter as the distance from the sound increases.	• Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how day length varies.	• Describe the movement of the Earth, and other planets, relative to the Sun in the solar system. • Describe the movement of the Moon relative to the Earth. • Describe the Sun, Earth and Moon as approximately spherical bodies. • Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.