

Leopard Images in a Mirror

Investigation Information and Standards Alignment

Subject

Science

Discipline

Physical Science

Grade

5

Description of Investigation

Students figure out the relationship between the location of an object and what can be seen in a mirror.

Alignment with Science TEKS

Teachers can use this investigation to help students reach any of the 5th Grade TEKS for science that are listed below.

(1) Science and Engineering Practices

(A) ask questions and define problems based on observations or information from text, phenomena, models, or investigations.

(B) use scientific practices to plan and conduct descriptive and simple experimental investigations and use engineering practices to design solutions to problems.

(C) demonstrate safe practices and the use of safety equipment during classroom and field investigations as outlined in Texas Education Agency-approved safety standards.

(D) use tools, including calculators, microscopes, hand lenses, metric rulers, Celsius thermometers, prisms, concave and convex lenses, laser pointers, mirrors, digital scales, balances, spring scales, graduated cylinders, beakers, hot plates, meter sticks, magnets, collecting nets, notebooks, timing devices, materials for building circuits, materials to support observations of habitats or organisms such as terrariums and aquariums, and materials to support digital data collection such as computers, tablets, and cameras to observe, measure, test, and analyze information.

(E) collect observations and measurements as evidence.

(F) construct appropriate graphic organizers used to collect data, including tables, bar graphs, line graphs, tree maps, concept maps, Venn diagrams, flow charts or sequence maps, and input-output tables that show cause and effect

(G) develop and use models to represent phenomena, objects, and processes or design a prototype for a solution to a problem.

(2) Science and Engineering Practices

(B) analyze data by identifying any significant features, patterns, or sources of error.

(3) Science and Engineering Practices

(A) develop explanations and propose solutions supported by data and models.

(B) communicate explanations and solutions individually and collaboratively in a variety of settings and formats

(C) listen actively to others' explanations to identify relevant evidence and engage respectfully in scientific discussion.

(8) Force, Motion, and Energy

(C) demonstrate and explain how light travels in a straight line and can be reflected, refracted, or absorbed.

Alignment with English Language Arts and Reading TEKS

Teachers can use this investigation to help students reach any of the 5th Grade TEKS for reading, writing, or speaking and listening that are listed below.

(1) Developing and sustaining foundational language skills

Leopard Images in a Mirror

Investigation Information and Standards Alignment

- (A) listen actively to interpret verbal and non-verbal messages, ask relevant questions, and make pertinent comments.
- (B) follow, restate, and give oral instructions that include multiple action steps.
- (C) give an organized presentation employing eye contact, speaking rate, volume, enunciation, natural gestures, and conventions of language to communicate ideas effectively; and
- (D) work collaboratively with others to develop a plan of shared responsibilities.

(4) Developing and sustaining foundational language skills: listening, speaking, reading, writing, and thinking-fluency.

The student reads grade-level text with fluency and comprehension. The student is expected to use appropriate fluency (rate, accuracy, and prosody) when reading grade-level text.

(5) Developing and sustaining foundational language skills: listening, speaking, reading, writing, and thinking--self-sustained reading.

The student reads grade-appropriate texts independently. The student is expected to self-select text and read independently for a sustained period of time.

(6) Comprehension skills: listening, speaking, reading, writing, and thinking using multiple texts.

- (A) establish purpose for reading assigned and self-selected texts.
- (B) generate questions about text before, during, and after reading to deepen understanding and gain information.
- (C) make and correct or confirm predictions using text features, characteristics of genre, and structures.
- (D) create mental images to deepen understanding.
- (E) make connections to personal experiences, ideas in other texts, and society.
- (F) make inferences and use evidence to support understanding.
- (G) evaluate details read to determine key ideas.
- (H) synthesize information to create new understanding.
- (I) monitor comprehension and make adjustments such as re-reading, using background knowledge, asking questions, and annotating when understanding breaks down.

(7) Response skills: listening, speaking, reading, writing, and thinking using multiple texts.

- (B) write responses that demonstrate understanding of texts, including comparing and contrasting ideas across a variety of sources.
- (C) use text evidence to support an appropriate response.
- (D) retell, paraphrase, or summarize texts in ways that maintain meaning and logical order.
- (E) interact with sources in meaningful ways such as notetaking, annotating, freewriting, or illustrating.
- (F) respond using newly acquired vocabulary as appropriate; and
- (G) discuss specific ideas in the text that are important to the meaning.

(11) Composition: listening, speaking, reading, writing, and thinking using multiple texts--writing process.

- (A) plan a first draft by selecting a genre for a particular topic, purpose, and audience using a range of strategies such as brainstorming, freewriting, and mapping.
- (B) develop drafts into a focused, structured, and coherent piece of writing by:
 - (i) organizing with purposeful structure, including an introduction, transitions, and a conclusion; and
 - (ii) developing an engaging idea reflecting depth of thought with specific facts and details.
- (C) revise drafts to improve sentence structure and word choice by adding, deleting, combining, and rearranging ideas for coherence and clarity.

Leopard Images in a Mirror

Investigation Information and Standards Alignment

- (D) edit drafts using standard English conventions, including:
- (i) complete simple and compound sentences with subject-verb agreement and avoidance of splices, run-ons, and fragments.
 - (ii) past tense of irregular verbs;
 - (iii) collective nouns;
 - (iv) adjectives, including their comparative and superlative forms;
 - (v) conjunctive adverbs;
 - (vi) prepositions and prepositional phrases and their influence on subject-verb agreement;
 - (vii) pronouns, including indefinite;
 - (viii) subordinating conjunctions to form complex sentences;
 - (ix) capitalization of abbreviations, initials, acronyms, and organizations;
 - (x) italics and underlining for titles and emphasis and punctuation marks, including quotation marks in dialogue and commas in compound and complex sentences; and
 - (xi) correct spelling of words with grade-appropriate orthographic patterns and rules and high-frequency words.
- (E) publish written work for appropriate audiences.

(12) Composition: listening, speaking, reading, writing, and thinking using multiple texts--genres.

- (B) compose informational texts, including brief compositions that convey information about a topic, using a clear central idea and genre characteristics and craft.
- (C) compose argumentative texts, including opinion essays, using genre characteristics and craft; and

Alignment with English Language Proficiency Standards (ELPS)

Teachers can use this investigation to help emerging multilingual students reach any of the TEKS for English language proficiency that are listed below.

(1) Cross-curricular second language acquisition/learning strategies

- (A) use prior knowledge and experiences to understand meanings in English.
- (B) monitor oral and written language production and employ self-corrective techniques or other resources.
- (C) use strategic learning techniques such as concept mapping, drawing, memorizing, comparing, contrasting, and reviewing to acquire basic and grade-level vocabulary.
- (D) speak using learning strategies such as requesting assistance, employing non-verbal cues, and using synonyms and circumlocution (conveying ideas by defining or describing when exact English words are not known).
- (E) internalize new basic and academic language by using and reusing it in meaningful ways in speaking and writing activities that build concept and language attainment.
- (F) use accessible language and learn new and essential language in the process.
- (G) demonstrate an increasing ability to distinguish between formal and informal English and an increasing knowledge of when to use each one commensurate with grade-level learning expectations.
- (H) develop and expand repertoire of learning strategies such as reasoning inductively or deductively, looking for patterns in language, and analyzing sayings and expressions commensurate with grade-level learning expectations.

(2) Cross-curricular second language acquisition/listening

- (C) learn new language structures, expressions, and basic and academic vocabulary heard during classroom instruction and interactions.
- (D) monitor understanding of spoken language during classroom instruction and interactions and seek clarification as needed.

Leopard Images in a Mirror

Investigation Information and Standards Alignment

(E) use visual, contextual, and linguistic support to enhance and confirm understanding of increasingly complex and elaborated spoken language.

(F) listen to and derive meaning from a variety of media such as audio tape, video, DVD, and CDROM to build and reinforce concept and language attainment.

(G) understand the general meaning, main points, and important details of spoken language ranging from situations in which topics, language, and contexts are familiar to unfamiliar.

(H) understand implicit ideas and information in increasingly complex spoken language commensurate with grade-level learning expectations.

(I) demonstrate listening comprehension of increasingly complex spoken English by following directions, retelling or summarizing spoken messages, responding to questions and requests, collaborating with peers, and taking notes commensurate with content and grade-level needs.

(3) Cross-curricular second language acquisition/speaking

(B) expand and internalize initial English vocabulary by learning and using high-frequency English words necessary for identifying and describing people, places, and objects, by retelling simple stories and basic information represented or supported by pictures, and by learning and using routine language needed for classroom communication.

(C) speak using a variety of grammatical structures, sentence lengths, sentence types, and connecting words with increasing accuracy and ease as more English is acquired.

(D) speak using grade-level content area vocabulary in context to internalize new English words and build academic language proficiency.

(E) share information in cooperative learning interactions.

(F) ask and give information ranging from using a very limited bank of high-frequency, high-need, concrete vocabulary, including key words and expressions needed for basic communication in academic and social contexts, to using abstract and content-based vocabulary during extended speaking assignments.

(G) express opinions, ideas, and feelings ranging from communicating single words and short phrases to participating in extended discussions on a variety of social and grade-appropriate academic topics.

(H) narrate, describe, and explain with increasing specificity and detail as more English is acquired.

(I) adapt spoken language appropriately for formal and informal purposes.

(J) respond orally to information presented in a wide variety of print, electronic, audio, and visual media to build and reinforce concept and language attainment.

(4) Cross-curricular second language acquisition/reading

(C) develop basic sight vocabulary, derive meaning of environmental print, and comprehend English vocabulary and language structures used routinely in written classroom materials.

(E) read linguistically accommodated content area material with a decreasing need for linguistic accommodations as more English is learned.

(F) use visual and contextual support and support from peers and teachers to read grade-appropriate content area text, enhance and confirm understanding, and develop vocabulary grasp of language structures, and background knowledge needed to comprehend increasingly challenging language.

(G) demonstrate comprehension of increasingly complex English by participating in shared reading, retelling or summarizing material, responding to questions, and taking notes commensurate with content area and grade level needs.

(H) read silently with increasing ease and comprehension for longer periods.

(I) demonstrate English comprehension and expand reading skills by employing basic reading skills such as demonstrating understanding of supporting ideas and details in text and graphic sources, summarizing text, and distinguishing main ideas from details commensurate with content area needs.

Leopard Images in a Mirror

Investigation Information and Standards Alignment

(J) demonstrate English comprehension and expand reading skills by employing inferential skills such as predicting, making connections between ideas, drawing inferences and conclusions from text and graphic sources, and finding supporting text evidence commensurate with content area needs.

(K) demonstrate English comprehension and expand reading skills by employing analytical skills such as evaluating written information and performing critical analyses commensurate with content area and grade-level needs.

(5) Cross-curricular second language acquisition/writing

(B) write using newly acquired basic vocabulary and content-based grade-level vocabulary.

(C) spell familiar English words with increasing accuracy and employ English spelling patterns and rules with increasing accuracy as more English is acquired.

(D) edit writing for standard grammar and usage, including subject-verb agreement, pronoun agreement, and appropriate verb tenses commensurate with grade-level expectations as more English is acquired.

(E) employ increasingly complex grammatical structures in content area writing commensurate with grade-level expectations, such as:

(i) using correct verbs, tenses, and pronouns/antecedents;

(ii) using possessive case (apostrophe *s*) correctly; and

(iii) using negatives and contractions correctly;

(F) write using a variety of grade-appropriate sentence lengths, patterns, and connecting words to combine phrases, clauses, and sentences in increasingly accurate ways as more English is acquired.

(G) narrate, describe, and explain with increasing specificity and detail to fulfill content area writing needs as more English is acquired.