

# Standards Correlations

## Veterinary Science II (8089)

Task	SOL Correlations
<b>Demonstrating Personal Qualities and Abilities</b>	
Demonstrate creativity and innovation.	<p>English: 6.1, 6.3, 6.4, 6.6, 6.7, 6.9, 7.1, 7.3, 7.4, 7.6, 7.7, 7.9, 8.1, 8.3, 8.4, 8.6, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8</p> <p>History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WG.4, WHI.1, WHII.1</p> <p>Mathematics: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.10, 6.11, 6.12, 7.2, 7.3, 7.8, 7.9, 8.2, 8.4, 8.6, 8.7, 8.11, 8.12, 8.17, 8.18, A.9, AFDA.3, AFDA.4, AFDA.5, AFDA.6, AFDA.7, AFDA.8, AII.9, COM.1, COM.3, COM.4, COM.5, COM.8, DM.7, DM.1*, DM.10, DM.2*, DM.3*, PS.3*, PS.4*, PS.7*, PS.9*, PS.10*</p> <p>Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PS.1</p>
Demonstrate critical thinking and problem solving.	<p>English: 6.1, 6.3, 6.4, 6.5, 6.6, 6.7, 6.9, 7.1, 7.3, 7.4, 7.5, 7.6, 7.7, 7.9, 8.1, 8.3, 8.4, 8.5, 8.6, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8</p> <p>History and Social Science: CE.1, CE.4, CE.11, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WG.4, WHI.1, WHII.1</p> <p>Mathematics: 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.10, 6.11, 7.2, 7.3, 7.8, 7.12, 7.13, 8.2, 8.4, 8.8, 8.9, 8.10, 8.11, A.8, A.9, G.1, G.13, G.14, AFDA.3, AFDA.5, AFDA.8, AII.9, AII.10, AII.11, COM.1, COM.3, COM.4, COM.5, COM.8, DM.4, DM.7, DM.1*, DM.2*, DM.3*, DM.9*, PS.9*, PS.10*</p> <p>Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PS.1</p>
Demonstrate initiative and self-direction.	<p>English: 6.1, 6.4, 6.6, 6.7, 6.9, 7.1, 7.4, 7.6, 7.7, 7.9, 8.1, 8.4, 8.6, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8</p> <p>History and Social Science: CE.1, CE.4, CE.11, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1</p>

<b>Task</b>	<b>SOL Correlations</b>
Demonstrate integrity.	English: 6.1, 7.1, 8.1, 9.1, 9.5, 10.1, 10.5, 11.1, 11.5, 12.1, 12.5 History and Social Science: CE.1, CE.3, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Demonstrate work ethic.	English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: CH.1
<b>Demonstrating Interpersonal Skills</b>	
Demonstrate conflict-resolution skills.	English: 6.1, 6.2, 6.4, 6.6, 6.7, 6.9, 7.1, 7.2, 7.4, 7.6, 7.7, 7.9, 8.1, 8.2, 8.4, 8.6, 8.7, 8.9, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, VUS.1
Demonstrate listening and speaking skills.	English: 6.1, 6.2, 6.4, 6.6, 7.1, 7.2, 7.4, 7.6, 8.1, 8.2, 8.4, 8.6, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Demonstrate respect for diversity.	English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.3, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, USII.9, VUS.1, VUS.13, WG.1, WHI.1, WHII.1
Demonstrate customer service skills.	English: 6.1, 6.4, 6.7, 7.1, 7.4, 7.7, 8.1, 8.4, 8.7, 9.1, 9.5, 9.6, 10.1, 10.5, 10.6, 11.1, 11.5, 11.6, 12.1, 12.5, 12.6 History and Social Science: CE.1, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Collaborate with team members	English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.3, CE.4, GOVT.1, GOVT.16, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
<b>Demonstrating Professional Competencies</b>	
Demonstrate big-picture thinking.	English: 6.1, 6.4, 7.1, 7.4, 8.1, 8.4, 9.1, 9.5, 10.1, 10.5, 11.1, 11.5, 12.1, 12.5 History and Social Science: CE.1, CE.4, CE.12, GOVT.1, GOVT.15, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1

<b>Task</b>	<b>SOL Correlations</b>
Demonstrate career- and life-management skills.	English: 6.1, 6.7, 7.1, 7.7, 8.1, 8.7, 9.1, 9.6, 10.1, 10.6, 11.1, 11.6, 12.1, 12.6 History and Social Science: CE.1, CE.4, CE.12, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 8.4
Demonstrate continuous learning and adaptability.	English: 6.1, 6.4, 6.7, 6.9, 7.1, 7.4, 7.7, 7.9, 8.1, 8.4, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.1, 11.5, 11.6, 11.8, 12.1, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.3, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: BIO.1, CH.1, LS.1, PH.1, PH.4, PS.1
Manage time and resources.	English: 6.1, 6.2, 6.4, 6.7, 6.9, 7.1, 7.2, 7.4, 7.7, 7.9, 8.1, 8.2, 8.4, 8.7, 8.9, 9.1, 9.5, 9.6, 9.8, 10.1, 10.5, 10.6, 10.8, 11.2, 11.5, 11.6, 11.8, 12.2, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.4, CE.11, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 6.10, 6.11, 6.12, 7.2, 7.3, 7.8, 7.9, 7.10, 7.11, 7.12, 7.13, 8.4, 8.11, 8.12, 8.13, 8.14, 8.17, 8.18, A.4, A.5, A.8, A.9, AFDA.3, AFDA.4, AFDA.5, AFDA.6, AFDA.7, AFDA.8, COM.1, COM.3, COM.5, COM.8
Demonstrate information-literacy skills.	English: 6.1, 6.2, 6.4, 6.6, 6.7, 6.9, 7.1, 7.2, 7.3, 7.4, 7.6, 7.7, 7.9, 8.1, 8.2, 8.3, 8.4, 8.6, 8.7, 8.9, 9.2, 9.5, 9.6, 9.8, 10.2, 10.5, 10.6, 10.8, 11.2, 11.5, 11.6, 11.8, 12.2, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 6.10, 6.11, 7.8, 7.9, 8.11, 8.12, A.8, A.9, AFDA.3, AFDA.4, AFDA.6, AFDA.7, AFDA.8, DM.8, PS.1*, PS.2*, PS.3*, PS.4*, PS.7*, PS.8*, PS.9*, PS.10* Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PH.1, PS.1
Demonstrate an understanding of information security.	English: 6.1, 6.2, 6.3, 6.4, 6.6, 6.7, 6.8, 6.9, 7.1, 7.2, 7.3, 7.4, 7.6, 7.7, 7.8, 7.9, 8.1, 8.2, 8.3, 8.4, 8.6, 8.7, 8.8, 8.9, 9.1, 9.2, 9.5, 9.6, 9.8, 10.1, 10.2, 10.5, 10.6, 10.8, 11.1, 11.2, 11.5, 11.6, 11.8, 12.1, 12.2, 12.5, 12.6, 12.8 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: COM.10

<b>Task</b>	<b>SOL Correlations</b>
Maintain working knowledge of current information-technology (IT) systems.	English: 6.1, 6.3, 6.4, 6.6, 6.9, 7.1, 7.3, 7.4, 7.6, 7.9, 8.1, 8.3, 8.4, 8.6, 8.9 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 7.8, COM.1, COM.2, COM.7, COM.9, COM.10, COM.11, COM.16, COM.18, PS.17 Science: BIO.1, CH.1, ES.1, PH.1
Demonstrate proficiency with technologies, tools, and machines common to a specific occupation.	History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 6.10, 6.11, 7.9, 8.4, A.7, A.8, A.9, AFDA.1, AFDA.3, AFDA.5, AII.4, AII.7, AII.9, COM.1, COM.7, COM.10, COM.11, COM.12, COM.16 Science: CH.1, ES.1, LS.1, PH.1, PS.1
Apply mathematical skills to job-specific tasks.	English: 6.4, 6.6, 6.7, 7.4, 7.6, 7.7, 8.4, 8.6, 8.7, 9.5, 9.6, 10.5, 10.6, 11.5, 11.6, 12.5, 12.6 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Mathematics: 6.1, 6.2, 6.5, 6.6, 6.12, 6.13, 6.14, 7.1, 7.2, 7.3, 7.4, 7.5, 7.6, 7.8, 7.9, 7.11, 7.12, 7.13, 8.4, 8.5, 8.6, 8.8, 8.9, 8.10, 8.11, 8.12, 8.13, 8.14, 8.15, 8.16, 8.17, 8.18, A.1, A.3, A.4, A.5, A.7, A.8, A.9, AFDA.1, AFDA.3, AFDA.5, AFDA.8, AII.3, AII.7, AII.9, AII.10, COM.1, COM.7 Science: 6.1, BIO.1, CH.1, ES.1, LS.1, PH.1, PS.1
Demonstrate professionalism.	English: 6.1, 7.1, 8.1, 9.1, 10.1, 11.1, 12.1 History and Social Science: CE.1, CE.4, CE.14, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1
Demonstrate reading and writing skills.	English: 6.1, 6.6, 6.7, 7.1, 7.6, 7.7, 8.1, 8.6, 8.7, 9.1, 9.5, 9.6, 9.7, 10.1, 10.5, 10.6, 10.7, 11.1, 11.5, 11.6, 11.7, 12.1, 12.5, 12.6, 12.7 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: 6.1, PH.1, PS.1
Demonstrate workplace safety.	English: 6.4, 7.4, 8.4, 9.5, 10.5, 11.5, 12.5 History and Social Science: CE.1, CE.4, GOVT.1, USI.1, USII.1, VUS.1, WG.1, WHI.1, WHII.1 Science: CH.1
<b>Examining All Aspects of an Industry</b>	

<b>Task</b>	<b>SOL Correlations</b>
Examine aspects of planning within an industry/organization.	History and Social Science: GOVT.16
Examine aspects of management within an industry/organization.	
Examine aspects of financial responsibility within an industry/organization.	
Examine technical and production skills required of workers within an industry/organization.	
Examine principles of technology that underlie an industry/organization.	
Examine labor issues related to an industry/organization.	History and Social Science: GOVT.16
Examine community issues related to an industry/organization.	History and Social Science: GOVT.16
Examine health, safety, and environmental issues related to an industry/organization.	History and Social Science: GOVT.16
<b>Addressing Elements of Student Life</b>	

<b>Task</b>	<b>SOL Correlations</b>
Identify the purposes and goals of the student organization.	
Explain the benefits and responsibilities of membership in the student organization as a student and in professional/civic organizations as an adult.	
Demonstrate leadership skills through participation in student organization activities, such as meetings, programs, and projects.	
Identify Internet safety issues and procedures for complying with acceptable use standards.	
<b>Exploring Work-Based Learning</b>	
Identify the types of work-based learning (WBL) opportunities.	
Reflect on lessons learned during the WBL experience.	
Explore career opportunities related to the WBL experience.	
Participate in a WBL experience, when appropriate.	

<b>Task</b>	<b>SOL Correlations</b>
<b>Exploring Leadership Opportunities through FFA</b>	
Identify the role of supervised agricultural experiences (SAEs) in agricultural education.	English: 9.3, 9.5, 10.3, 10.5, 11.3, 11.5, 12.3, 12.5
Participate in an SAE.	English: 9.5, 9.8, 10.5, 10.8, 11.5, 11.8, 12.5, 12.8
Identify the benefits and responsibilities of FFA membership.	English: 9.5, 9.6, 9.7, 9.8, 10.5, 10.6, 10.7, 10.8, 11.5, 11.6, 11.7, 11.8, 12.5, 12.6, 12.7, 12.8
Describe leadership characteristics and opportunities as they relate to agriculture and FFA.	English: 9.5, 10.5, 11.5, 12.5 History and Social Science: VUS.8, VUS.9, VUS.10, VUS.11, WHIL.8, WHIL.10, WHIL.11
Apply for an FFA degree and/or an agricultural proficiency award.	English: 9.5, 10.5, 11.5, 12.5
<b>Handling Common Exotic Companion Animals</b>	
Explain husbandry of common exotic animals.	English: 11.5, 12.5
Describe how to lift and carry common exotic animals.	English: 11.5, 12.5
Describe methods of moving nonaggressive common exotic animals into and out of cages or enclosures.	English: 11.5, 12.5
Describe nutritional needs of, and feeding procedures for, common exotic animals.	English: 11.5, 12.5

<b>Task</b>	<b>SOL Correlations</b>
Describe restraint procedures to facilitate veterinary examination of common exotic animals.	English: 11.5, 12.5
Explain how to perform a partial water change and filter change on an aquarium.	English: 11.5, 12.5
<b>Understanding Laboratory Procedures</b>	
Explain precautionary safety measures and their importance in a work environment for veterinary staff, as well as the standards designated by OSHA.	English: 11.5, 12.5  Science: CH.1
Explain the importance of performing and reporting all laboratory procedures with complete accuracy.	English: 11.5, 12.5
Demonstrate the management of laboratory samples.	English: 11.5, 12.5
Perform the procedure for preparing and staining blood films and cytologies.	
Perform a urinalysis.	English: 11.5, 12.5
Describe common abnormalities seen in blood films, cytologies, and urinalysis.	English: 11.5, 12.5
<b>Demonstrating Hospital Procedures</b>	



<b>Task</b>	<b>SOL Correlations</b>
Identify veterinary instruments and equipment and their uses.	English: 11.5, 12.5
Demonstrate methods for cleaning, disinfecting, and preparing surgical instruments.	English: 11.5, 12.5
Describe restraint procedures to facilitate veterinary examination of animals.	
Demonstrate bandaging, splinting, and removal methods.	English: 11.5, 12.5
Demonstrate method for applying a Robert Jones (RJ) bandage.	
Identify needle gauge sizes for animals, syringe types, and their uses.	
Demonstrate use of syringes.	
Explain dental care for animals.	English: 11.5, 12.5
Explore spaying and neutering options.	English: 11.3, 11.5, 12.3, 12.5
Demonstrate preparation of a patient for surgery.	English: 11.5, 12.5
Demonstrate opening a sterile surgery pack.	

<b>Task</b>	<b>SOL Correlations</b>
Prepare a surgical pack for sterilization.	
Demonstrate surgical site preparation, using required PPE.	
Demonstrate suture removal.	
Demonstrate administering an oral tablet or capsule.	English: 11.5, 12.5
<b>Understanding Disease and Disease Prevention</b>	
Explain the concept of disease.	English: 11.3, 11.5, 12.3, 12.5 Science: BIO.3, BIO.4
Describe the characteristics of disease-producing agents.	English: 11.5, 12.5 Science: BIO.4
Explain common animal diseases and their treatments.	English: 11.5, 12.5
Describe the concept of immunity.	English: 11.3, 11.5, 12.3, 12.5
Explain basic vaccine concepts.	
Identify common animal diseases that can be prevented by vaccination.	English: 11.5, 12.5
Describe the factors involved in vaccination schedules.	English: 11.5, 12.5
Explain concepts of animal quarantine and isolation.	English: 11.5, 12.5

Task	SOL Correlations	
Describe common contagious diseases and their clinical signs in companion animals.	English: 11.5, 12.5	
Describe treatments and preventive measures for common contagious diseases.	English: 11.5, 12.5	
<b>Understanding Parasitology</b>		<b>Understanding</b>
Explain concepts of parasitology.	English: 11.5, 12.5 Science: BIO.4	
Identify parasites that commonly affect animals.	English: 11.5, 12.5	
Explain the life cycle of parasites and its relationship to parasitic infestation, detection, and treatment.	English: 11.5, 12.5	
Describe the clinical signs and symptoms of common parasitic infestations.	English: 11.5, 12.5	
Demonstrate standard diagnostic procedures for determining the presence of parasites.		
Describe preventive measures and common treatments for parasitic infestation.	English: 11.5, 12.5	
<b>Understanding Veterinary Pharmacology</b>		

<b>Task</b>	<b>SOL Correlations</b>
Explain the concept of pharmacology.	English: 11.3, 11.5, 12.3, 12.5
Describe regulatory agencies and professional organizations that focus on pharmacology used in the animal industry.	English: 11.5, 11.8, 12.5, 12.8 History and Social Science: GOVT.8, GOVT.15
Describe the categories of commonly used veterinary medications.	English: 11.5, 12.5
Explain the schedules of controlled substances.	English: 11.3, 11.5, 12.3, 12.5 History and Social Science: GOVT.14, VUS.8
Demonstrate routes of medication administration.	English: 11.5, 12.5
Describe factors that affect dose determination.	English: 11.5, 12.5
Calculate dosages for weight-based medications.	English: 11.5, 12.5 Mathematics: AII.3
Interpret information on medication labels.	English: 11.5, 12.5
Explain the importance of avoiding specific drug combinations.	English: 11.5, 12.5
Demonstrate administration of oral and topical medications.	English: 11.5, 12.5

<b>Task</b>	<b>SOL Correlations</b>
Demonstrate administration of aural medications.	English: 11.5, 12.5
Demonstrate administration of ophthalmic medications.	English: 11.5, 12.5
Demonstrate filling a syringe for injection.	English: 11.5, 12.5
Demonstrate administration of an intramuscular injection.	English: 11.5, 12.5
Demonstrate administration of a subcutaneous injection.	English: 11.5, 12.5
Demonstrate how to prepare and dispense medications that a client will administer at home.	English: 11.5, 12.5
<b>Performing Mathematical Operations (Posology)</b>	
Complete basic four-function operations with whole numbers, fractions, and decimals.	English: 11.5, 12.5
Identify basic units of the commonly used systems of measurement.	English: 11.5, 12.5
Perform conversions between common systems of measurement.	English: 11.5, 11.6, 12.5, 12.6
Measure liquids.	English: 11.5, 12.5  Science: CH.1

<b>Task</b>	<b>SOL Correlations</b>
Dilute liquids, following label directions.	English: 11.5, 12.5 Science: CH.1
Calculate amounts for dilutions.	English: 11.3, 11.5, 12.3, 12.5 Mathematics: AII.3
Solve word problems associated with veterinary medicine.	English: 11.5, 12.5 Mathematics: AII.3
<b>Exploring First Aid on Animals</b>	
Explain the concept of first aid.	English: 11.3, 11.5, 12.3, 12.5
Describe the components of an animal first-aid kit and the uses of each.	English: 11.5, 12.5
Identify common situations and conditions requiring first aid.	English: 11.5, 12.5
Describe how to prioritize common emergencies.	English: 11.3, 11.5, 12.3, 12.5
Identify local resources for animal care.	English: 11.5, 12.5
<b>Maintaining Professional and Ethical Standards</b>	
Explain the relationship between animal welfare and the animal rights movement.	English: 11.5, 12.5 History and Social Science: GOVT.11, GOVT.15
Explain mental demands and personal coping mechanisms	English: 11.5, 12.5

<b>Task</b>	<b>SOL Correlations</b>
of various animal-care professionals.	
Describe ethical standards for veterinary practice.	English: 11.5, 12.5 History and Social Science: GOVT.16
<b>Performing Office Functions</b>	
Explain the layout of the veterinary facility and rationale for the design.	English: 11.5, 12.5
Describe use of current veterinary-specific computer software.	English: 11.5, 12.5 History and Social Science: VUS.14
Check client in and out.	English: 11.5, 12.5 History and Social Science: GOVT.16
Maintain patient identification.	English: 11.5, 12.5
Describe how to handle client inquiries about products or services.	English: 11.5, 12.5
<b>Exploring Emerging Technologies in Veterinary Sciences</b>	
Identify current and emerging technologies and advances in veterinary science.	English: 11.5, 12.5 History and Social Science: VUS.14
Explain the concept of biotechnology as it relates to veterinary science.	English: 11.5, 12.5 Science: BIO.1
<b>Understanding Genetics and Breeding</b>	

<b>Task</b>	<b>SOL Correlations</b>
Explain the relationship among genes, chromosomes, and deoxyribonucleic acid (DNA).	English: 11.5, 12.5 Science: BIO.2, BIO.5
Explain the formation of gametes and zygotes and their relationship to inherited traits.	English: 11.5, 12.5 Science: BIO.5
Describe the use of genetics in selective breeding.	English: 11.5, 12.5 Science: BIO.5
Compare outcrossing/mixed breeding, line breeding, and inbreeding.	English: 11.3, 11.5, 12.3, 12.5 Science: BIO.5
Describe breeding cycles.	English: 11.5, 12.5
Analyze the ethical aspects of breeding.	English: 11.5, 12.5
<b>Working with Wildlife</b>	
Identify wildlife species common to the locale.	English: 11.5, 12.5
Locate a wildlife rehabilitator for a given species.	English: 11.5, 12.5
Describe provision of interim care to injured or orphaned wildlife.	English: 11.5, 12.5
Explain legal issues affecting the care and handling of wildlife.	English: 11.5, 12.5 History and Social Science: GOVT.8, GOVT.9, GOVT.10, GOVT.15



