

Air Quality and Dust Management: Curricular Materials for Rural Schools

Introduction

Local Alaskan governments make many decisions affecting the quality of the air people breathe. We make choices about how we generate power and how we heat buildings. We make choices about how we maintain good indoor and outdoor air quality. Our hope at DEC is that village schools can support current and future decision-making about local air quality by teaching children to actively think and learn about air, air quality, and the consequences of our choices.

The school activities and materials we are developing are intended to introduce students to many aspects of air quality, to direct and indirect consequences of their choices, and to the interconnectedness of our air quality with that of other Polar and Northern regions. We are specifically developing activities that can lead to study of dust as an environmental, health, and road problem in rural villages.

As currently drafted, these activities are intended to get students thinking about their local air quality and what might change it. Arousing student curiosity and speculation through the Key Concepts and Questions is far more important than any of the specific examples we list. Local examples will always be more meaningful than examples from elsewhere. Right now, we are developing activities at levels of increasing complexity, but the level of presentation for these materials will be up to the teachers.

This represents a first, preliminary step in an ongoing process to develop a curriculum about dust issues in Alaska, so we really do seek all your comments, criticisms, ideas, and contributions.

We are interested in partners who can provide local perspectives and directions for the educational materials.

Organization

We are developing a six-tiered organization for a Rural Dust Curriculum. We rely on the expertise of individual teachers to decide how best they can approach each topic. Teachers can choose to discuss key concepts and discussion questions first, or to do an activity first, before much discussion. Rural dust issues and the impact of dust on air quality also provide great opportunities for inquiry-based learning.

Organizational Model

Key Concept

Why this concept?

Questions to help understand the concept

Some answers/materials to support teachers

Student activities

Possible student inquiries

Some Key Concepts:

Air	Deposition/erosion	Experimentation
Atmosphere	Transport	Roadbuilding
Particles (aerosols)	Health/breathing	Choices
Dust	Measurement	Careers
Emissions	Scale	

Some Types of Activities:

What's in the Air?

Discussion and personal observations
Sampling air, snow, earth, exhaust from engines
Environmental measurements

What about local dust?

Discussion: Do you like it? Want it? Is it part of the air or part of the ground?
Do we make it? How? Where is it from? Where does it go?
What does it change?
Mapping dust activities
Road characterization studies
Model landscapes
Regional/global activities

Experiments with dust makers, dust collectors, dust control, roadbuilding

Self-directed, probably lengthy and messy and fun! (starting with a model village)

Problem-based learning approaches

Health, roads, regulations, other aspects of air quality (local choice)

Curricular Standards: ... upcoming

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