Annotated activity list

* Steckbriefe (particle cards)  - introduces concept of standard model, fundamental particles, and use of classifucation in science
* Rolling with Rutherford - introduces indirect measurement, statistics, histogram and its analysis, use of probability
* Quark Workbench - introduces quark combination rules, leads to importance of electrical and color charge
* Muon attenuation - introduces concept of attentuation of particles passing through a medium, exponential decay. Follow-up requires computer and internet but may stand on its own without these.
* Muon lifetime - introduces (exponential) particle decay, lifetime, and half-life. Uses both classroom simulation and actual cosmic ray data. Follow-up requires computer and internet but may stand on its own without these.
* Mass Calc Z - uses conservation of momentum and mass-energy to enable students to calculate Z mass from actual ATLAS and CMS events (specially chosen near-transverse to beamline so students may do 2-dimensional analysis).
* Top Quark Mass - uses conservation of momentum and mass-energy with calculation of missing Et to enable students to calculate top mass from one actual and several simulated D-Zero events (specially chosen near-transverse to beamline and in tt-bar rest frame so students may do relatively simple 2-dimensional analysis).
* ATLAS or CMS data express - simplified masterclass-like Z mass analysis from static event displays on PDF. Computer is helpful but not needed.
* TOTEM data express - analysis of TOTEM static event displays on PDF to make proton-proton interference pattern and find an upper limit to proton diameter. Uses interference/diffraction of quantum objects and statistical analysis combined with classical diffraction. Computer is helpful but not needed.
* ATLAS or CMS masterclass - no need to describe! Uses computer.
* CMS e-Lab - enables analysis of relatively large sets of actual CMS data with scaffolding to understand and milestones guide investigation. Requires computer and internet.
* Build cloud chambers - great exercise for introduction to particles, a little simple instrumentation physics. Requires dry ice and near-pure alcohol.
* Helmoltz coil e/m apparatus - great way to introduce particle beams, lorentz force, etc. If we cannot borrow from a university in Kigali we would have to bring them. Fragile.